

ASAM ASAP3 Interface

User's Guide



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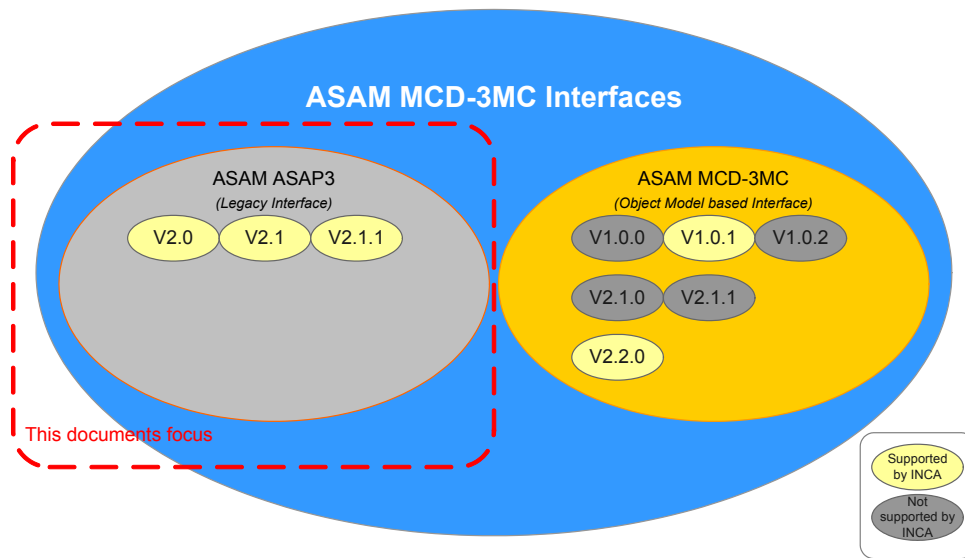
Contents

1	INCA ASAM ASAP3 Interface Overview	5
1.1	Safety Advice	6
1.2	Definition of Terms	7
1.3	Further Information	7
1.4	ASAM ASAP3 Server	7
1.4.1	Communication	7
2	User Interface	9
2.1	ASAM MCD-3MC 4 INCA Interface Window (ASAM-ASAP3 server GUI)	9
2.2	The Toolbar	9
2.3	ASAM-ASAP3 Status Icon in Taskbar	9
2.4	Communication Options	10
2.5	Logging in the Interface Window	11
2.6	Options	12
2.6.1	General Options	12
2.6.2	Map Editor Options	13
2.6.3	Online Options	14
2.6.4	Recorder Options	15
2.6.5	View Options	17
2.6.6	Compatibility Options	18
2.7	Usage of ASAP3.INI	20
2.8	Measurement modes	20
2.8.1	Old measure mode (Compatibility mode)	20
2.8.2	New measure mode	21
2.9	Search Mechanism for ASAM ASAP3 Variables	22
2.10	Realization of ASAM ASAP3 Commands in INCA	22
2.11	Performance considerations	23
2.12	FULI – Fast Upper Level Interface (INCA-MCE)	24
2.13	INCA GUI	24
3	Implementation Notes for Commands	26
3.1	EMERGENCY COMMAND: 1	26
3.2	INIT COMMAND: 2	26
3.3	IDENTIFY COMMAND: 20	26
3.4	EXIT COMMAND: 50	27
3.5	SELECT DESCRIPTION-FILE AND BINARY FILE COMMAND: 3	28
3.6	DEFINE DESCRIPTION-FILE AND BINARY FILE COMMAND: 30	30
3.7	COPY BINARY FILE COMMAND: 4	34
3.8	CHANGE BINARY FILE NAME COMMAND: 5	35
3.9	SELECT LOOKUP TABLE COMMAND: 6	35
3.10	PUT LOOKUP TABLE TO AP-S COMMAND: 7	36
3.11	GET LOOKUP TABLE FROM AP-S COMMAND: 8	38
3.12	GET LOOKUP TABLE VALUE COMMAND: 9	39
3.13	INCREASE LOOKUP TABLE COMMAND: 10	39
3.14	SET LOOKUP TABLE COMMAND: 11	40
3.15	PARAMETER FOR VALUE ACQUISITION COMMAND: 12	40

- 3.16 SWITCHING OFFLINE/ONLINE COMMAND: 13 42
- 3.17 GET ONLINE VALUE COMMAND: 19 42
- 3.18 GET USER DEFINED VALUE COMMAND: 21..... 43
- 3.19 GET USER DEFINED VALUE LIST COMMAND: 22 44
- 3.20 GET PARAMETER FROM AP-S COMMAND: 14..... 44
- 3.21 SET PARAMETER ON AP-S COMMAND: 15 45
- 3.22 DEFINE RECORDER PARAMETERS COMMAND: 41 46
- 3.23 DEFINE TRIGGER CONDITION COMMAND: 42 47
- 3.24 ACTIVATE RECORDER COMMAND: 43 49
- 3.25 GET RECORDER STATUS COMMAND: 44 49
- 3.26 GET RECORDER RESULTS HEADER COMMAND: 45..... 50
- 3.27 GET RECORDER RESULTS COMMAND: 46..... 50
- 3.28 SAVE RECORDER FILE COMMAND: 47 51
- 3.29 LOAD RECORDER FILE COMMAND: 48 52
- 3.30 SET GRAPHIC MODE ON AP-S COMMAND: 16 52
- 3.31 RESET DEVICE COMMAND: 17..... 52
- 3.32 SET FORMAT COMMAND: 18 53
- 3.33 SET CASE SENSITIVE LABELS COMMAND: 61 53
- 3.34 EXTENDED GET PARAMETER COMMAND: 114 54
- 3.35 EXTENDED SET PARAMETER COMMAND: 115..... 55
- 3.36 EXTENDED PARAMETER FOR VALUE ACQUISITION COMMAND: 112..... 56
- 3.37 EXTENDED GET ONLINE VALUE COMMAND: 119 58
- 3.38 EXTENDED QueryAvailableServices COMMAND: 200 58
- 3.39 EXTENDED GetServiceInformation COMMAND: 201 59
- 3.40 EXTENDED ExecuteService COMMAND: 202..... 61
- 3.41 EXTENDED GetWorkingPoint COMMAND: 42001..... 65
- 3.42 Known Problems 66
- 4 Appendix: ASAP3 Error Codes..... 67
 - 4.1 Errors in Log Window without Error Code returned to AuSy..... 67
 - 4.2 Errors in Log Window with Error Code returned to AuSy 67
- 5 ETAS Contact Addresses 89

1 INCA ASAM ASAP3 Interface Overview

There are a bunch of ASAM MCD-3MC Interfaces. The following figure gives an overview on the ASAM MCD-3MC Interfaces.



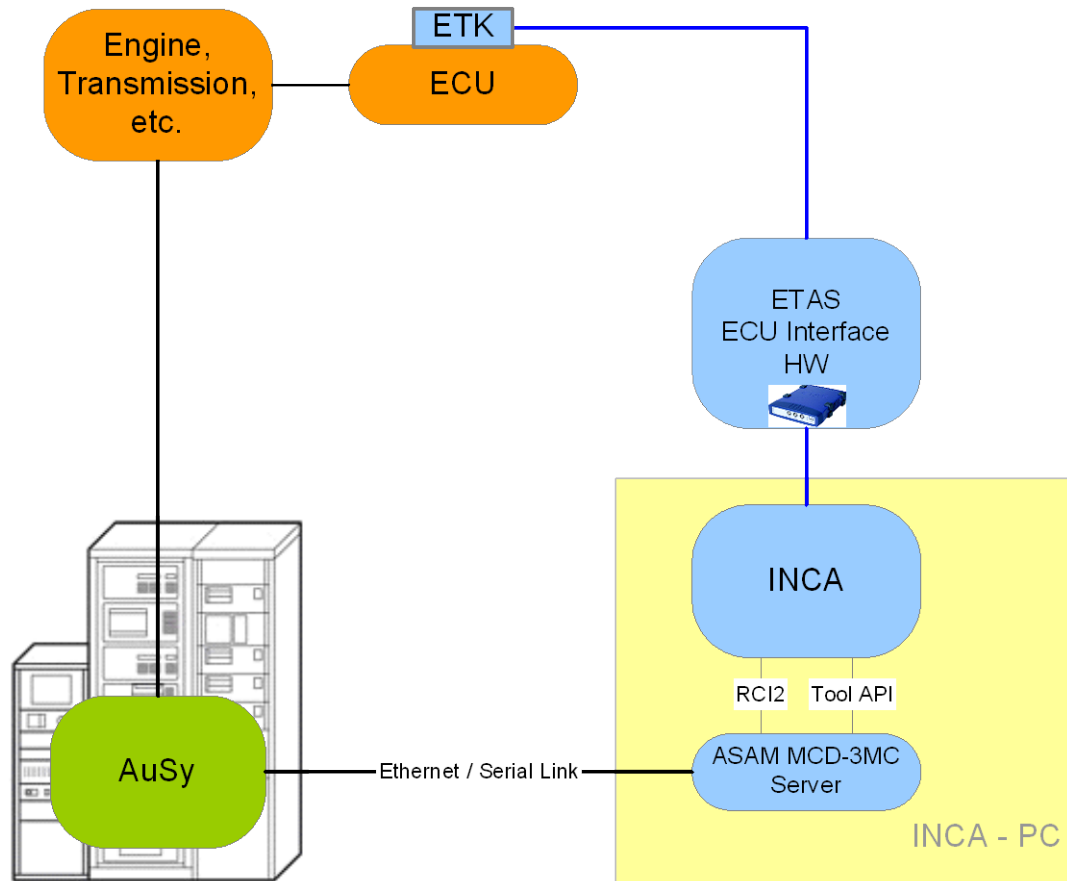
This document describes the ETAS implementation of the ASAM ASAP3 interface for INCA. The term "ASAP3" is alternatively used as abbreviation for "ASAM ASAP3" within this document.

INCA's ASAP3 interface implements the ASAP3 V2.1.1 standard but also supports the previous versions V2.0 and V2.1 covered by this document.

The executable which implements these interfaces is called "ASAP3.EXE" or "ASAM ASAP3 Server". In fact, ASAP3.EXE implements both, the legacy ASAP3 interface and the new ASAM MCD-3MC V1.0.1 interface side by side. The selection is done by choosing the MCD3 Version to use in the INCA GUI. This is mentioned here only for the sake of completeness.

The legacy ASAM ASAP3 interface is no longer a maintained standard. It differs from the new generation ASAM MCD-3MC Vx.y.z standard fundamentally. Nevertheless it is still used by a respectable number of systems.

The following graphic gives an overview on how all the components work together:



The ASAM ASAP3 interface, illustrated with the general expression ASAM MCD-3MC Interface, listens at its Ethernet port (or Serial Link (RS232)) for commands sent by the Automation System (AuSy). These commands are translated into several calls to the Tool API / RCI2 interface of the INCA core and also logged into the ASAM MCD-3MC interface window by the ASAM MCD-3MC Server of INCA.

1.1 Safety Advice



WARNING!

Calibration activities influence the behavior of the ECU and the systems controlled by the ECU. This may result in unexpected behavior of the vehicle and thus can lead to safety critical situations.

Only well trained personnel should be allowed to perform calibration activities.

1.2 Definition of Terms

LUN:

In INCA, the ASAP3 LUN is a device with a certain associated project and binary data.

Map Number:

The map number is used to identify a certain map that is to be used for further map access. Despite its name, it is also used for 1D calibration objects (Curves). In INCA, the Map Number corresponds to a map or curve that is visible (or invisible) in the INCA Experiment.

MC:

Short for Measurement and Calibration.

MCS / MC-S:

MC System, in this case INCA is meant.

AP-S:

Other expression for MCS (Application System)

AuSy:

Automation System

ASAM MCD-3MC Interfaces:

They are used to talk about ASAM MC Automation Interfaces in general.

ASAM ASAP3:

ASAM's legacy Automation Interface taken over by the ASAP standardization community. By now, ASAM has joined the international ASAM community.

ASAM MCD-3MC Vx.y.z

ASAM's new generation object model based automation interface. To be precise, this has always to be mentioned with a version number (Not part of this document).

1.3 Further Information

Information on the ASAM ASAP3 is provided in the INCA online help.

1.4 ASAM ASAP3 Server

The ASAM ASAP3 Server is an additional program (ASAP3.exe) running on the same computer as INCA. It is started out of the INCA experiment via menu Components|ASAM-3MC: Open ASAM-3MC Interface.

1.4.1 Communication

Two different communication types are supported: Serial communication or TCP/IP communication.

Serial Communication Options:

- Standard: Serial, 9600 Baud (adjustable up to 115200 Baud) 8N1 (8 Data bits, no parity, one stop bit); the quality of the connection, especially above 9600Baud, depends on the current system configuration and the quality of the device drivers. Port and Baud rate can be adjusted by the user.

Network (TCP/IP) Communication Options:

- The implementation uses TCP/IP sockets for communication. ASAP3.EXE works as a server, it listens at a specific IP address and port number for incoming connection requests. As soon as a connection is established, the status line shows the IP addresses of both communicating instances, server and client.
- It is possible to choose to listen at a specific network card installed in the current PC or at a specific Local Network (IP) address.
- In case Network Card is selected, it is possible to choose among all installed network cards that are found in the current PC.

- In case Local Network Address is selected, a fixed IP address at which a socket will listen can be entered, or you can enter "0" (zero) to listen at the default IP address of the current PC.
- The network port at which ASAM-ASAP3 will listen can also be entered. The default value is 22222.
- If you choose to use fast socket communication, a specific, faster communication routine is used.

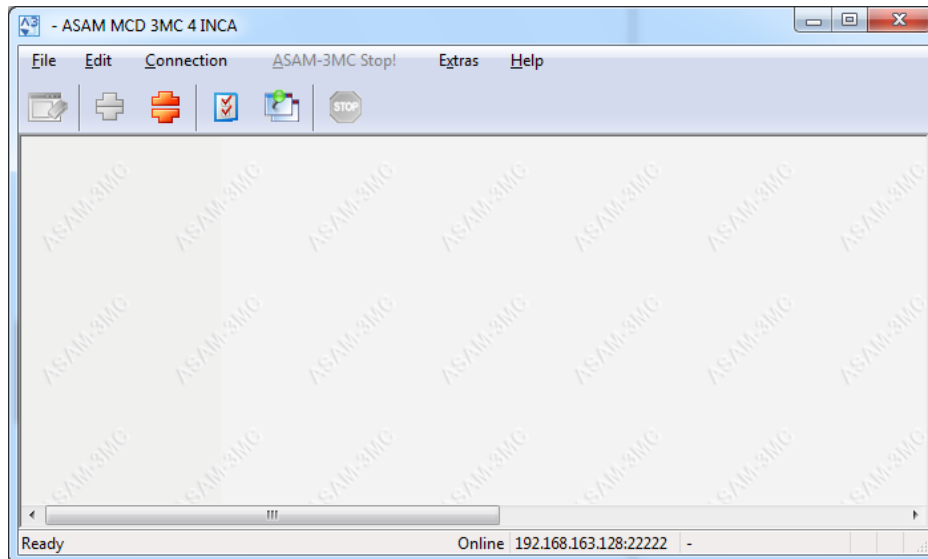
Both communication types:

- After starting the ASAM-3MC interface, the software tries to setup the last used communication type along with the last communication options stored in the windows registry.
- The communication parameters can be adjusted after breaking the connection. The connection can be broken explicitly only while there is no active ASAP3 session.
- The ASAM-ASAP3 interface can be adjusted in a way that it does not send an immediate acknowledge back after each received command. This can be changed from the "Options/General/Send Acknowledge" settings.
- For serial connections, the reaction on a not completely received command can be adjusted via the registry. It offers the possibility to set a value for the time-out, after which an error shall be regarded.
- In addition to the EXIT command, you have the possibility to stop an ASAP3 session in the ASAM-ASAP3 interface. This releases allocated resources (LUNs, Kf-Nr, ...).

2 User Interface

The ASAM-MCD-3MC interface implementation displays an own window on the screen. The last used window positions are saved in the registry.

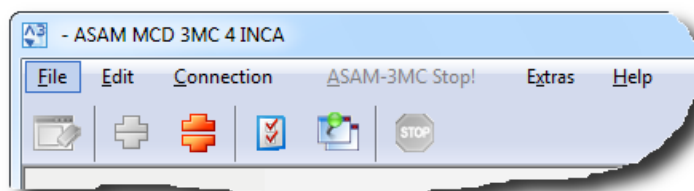
2.1 ASAM MCD-3MC 4 INCA Interface Window (ASAM-ASAP3 server GUI)



In the status bar, information about the connection is displayed. This comprises information about the state (Online, Offline), the selected serial port and the selected baud rate. During receiving or transmitting the data the symbols 'Rx' and 'Tx' indicate this activity.

The window can be displayed permanently in the topmost position; the option is saved in the registry.

2.2 The Toolbar



The toolbar on top of the viewer window gives fast access to all essential menu commands of the ASAM-ASAP3 interface.

2.3 ASAM-ASAP3 Status Icon in Taskbar

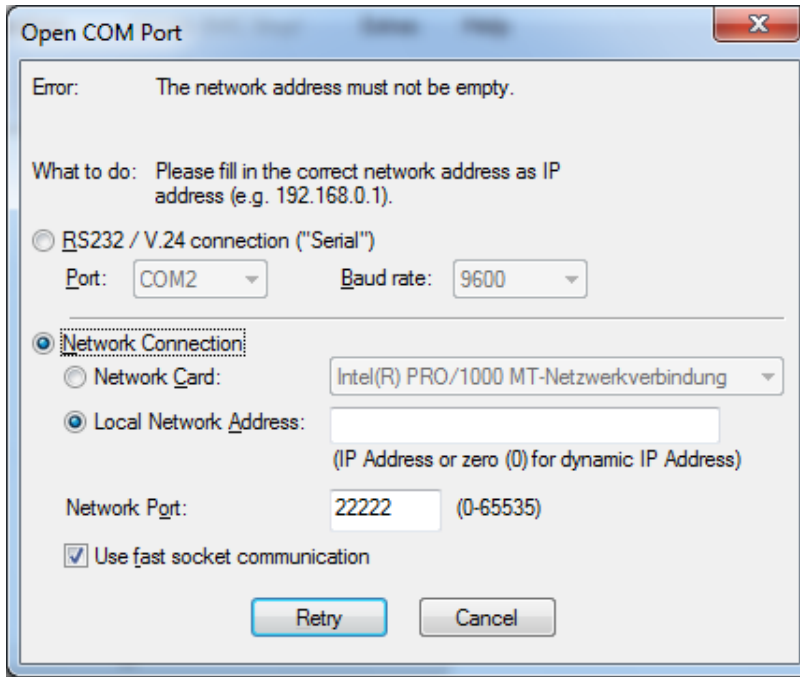


In the system tray an ASAM-ASAP3 icon indicating the communication state is shown. The signs for transmit (Tx) and receive (Rx) are dark grey, as long as the command INIT hasn't

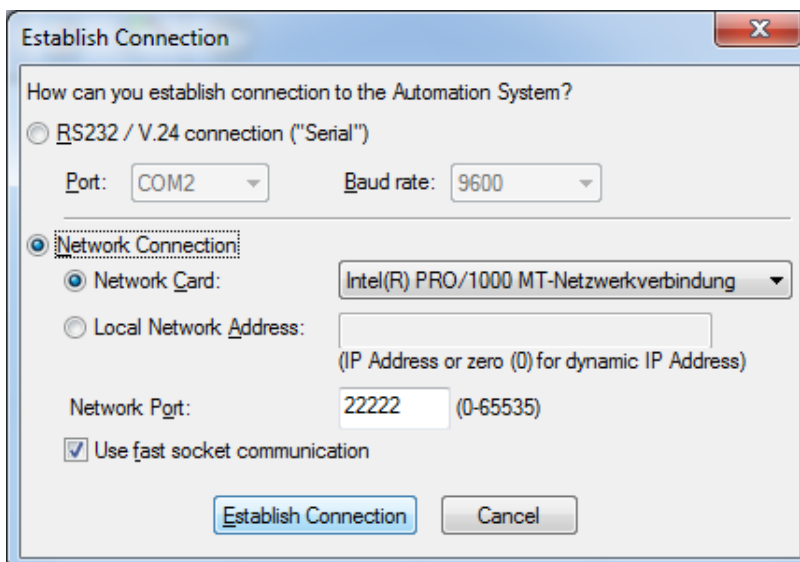
been sent yet. After this, the signs are displayed in white color. Transmission is shown by red flushing.

2.4 Communication Options

The following dialog box is displayed when the opening of a COM port or a network interface failed. This can happen during the start of the ASAM-ASAP3 interface, when it automatically tries to setup communication with the saved parameters. It can also happen when re-establishing the connection with other communication parameters.

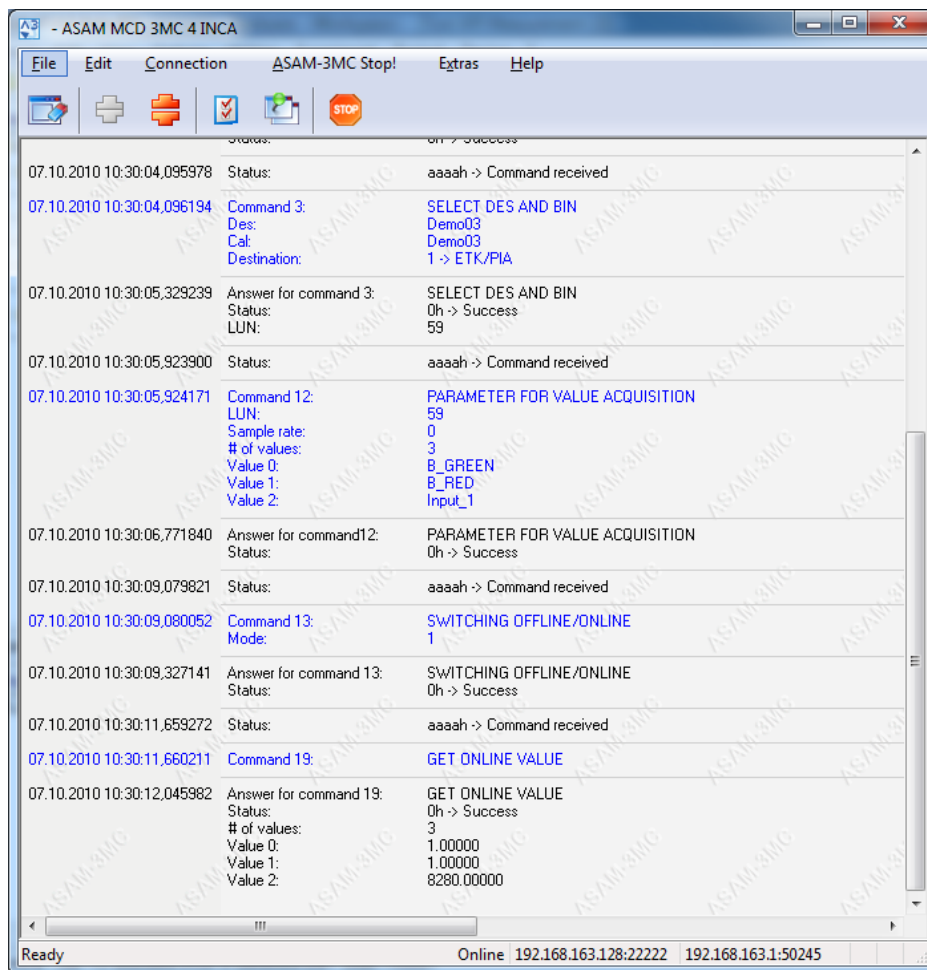


The following dialog box is used to re-establish the connection (with different communication parameters) after manually breaking the connection with the menu command 'Break Connection'.



2.5 Logging in the Interface Window

Received commands are displayed in blue color. The answer of a command is displayed in black color. Error messages are displayed in red. The last 1000 lines are buffered for display in the window.



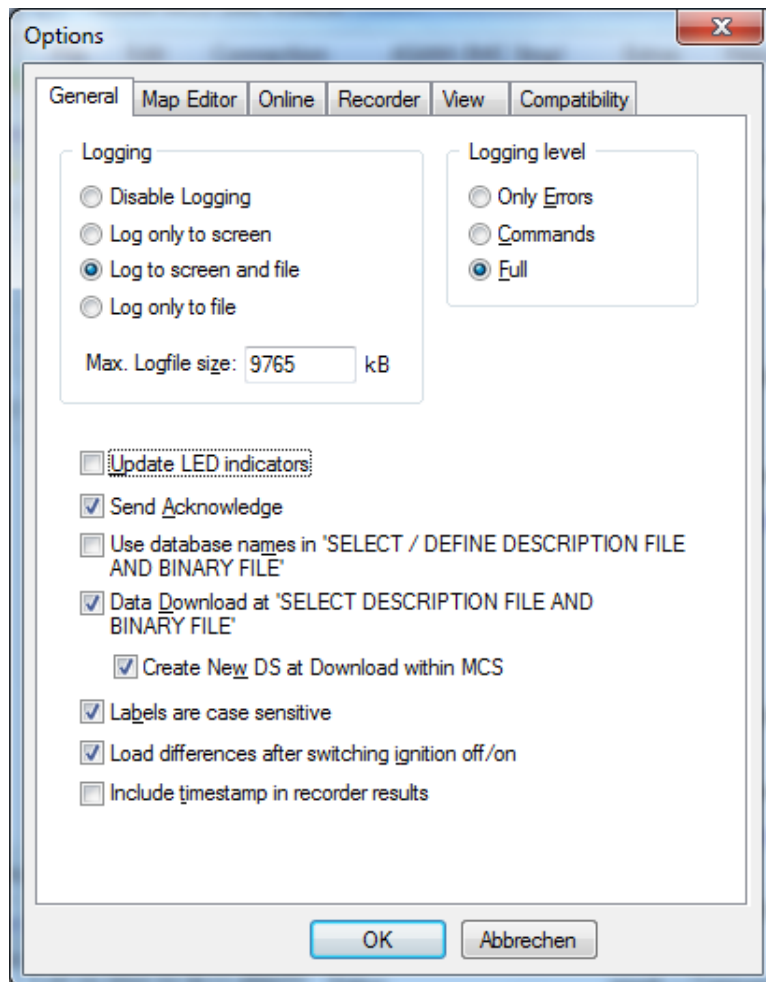
It is possible to reset the log window via the menu option File|Clear Window. Furthermore it is possible to select one or more lines with the mouse or all lines with CTRL+A (Keyboard) or via the Menu (Edit|Select All). A selection can be copied to the clipboard with CTRL+C (Keyboard) or via the Menu (Edit|Copy) and then be pasted into any text editor.

Each new command line contains a timestamp with a precision of 1µs.

2.6 Options

The options can be modified by a tabbed dialog with the following sections.

2.6.1 General Options



Logging

The user can select whether he wants to Disable Logging (for fastest operation), Log only to screen, Log to screen and file or Log only to file.

The maximum size of the log file can be adjusted with the field Max log file size. The given amount times 1024 is the maximum log file size in bytes.

If Log to screen and file or Log only to file is selected, the logged data is also written to the file ASAP3.LOG in the ASAP3 log directory, which is located below the INCA log directory. The file is created, if not yet existent. Otherwise the new data is appended to the file. The log file has to be deleted by the user if not needed anymore. Logging to file will stop automatically if not more than 1MB free disk space is available.

Logging level

The user can select whether he wants to log *Only Errors*, only the *Commands*, or to perform a *Full* logging which displays also the parameters of the commands and answers.

Further options

If *Update LED Indicators* is selected the LED's in the system tray and the indicators in the status bar will be updated when sending or receiving a telegram, otherwise not. This option improves performance if disabled.

Selecting *Send Acknowledge* causes the ASAM-ASAP3 interface to send an acknowledge after each command it received successfully. The acknowledge is defined with the status code \$AAAA.

If *Use database names in 'SELECT / DEFINE DESCRIPTION FILE AND BINARY FILE'* is selected, parameters in these commands are interpreted as locations within the INCA database instead of names within the PCs file system.

If *Data Download at 'Select Description and Binary File'* is selected, the data is automatically downloaded to the ECU.

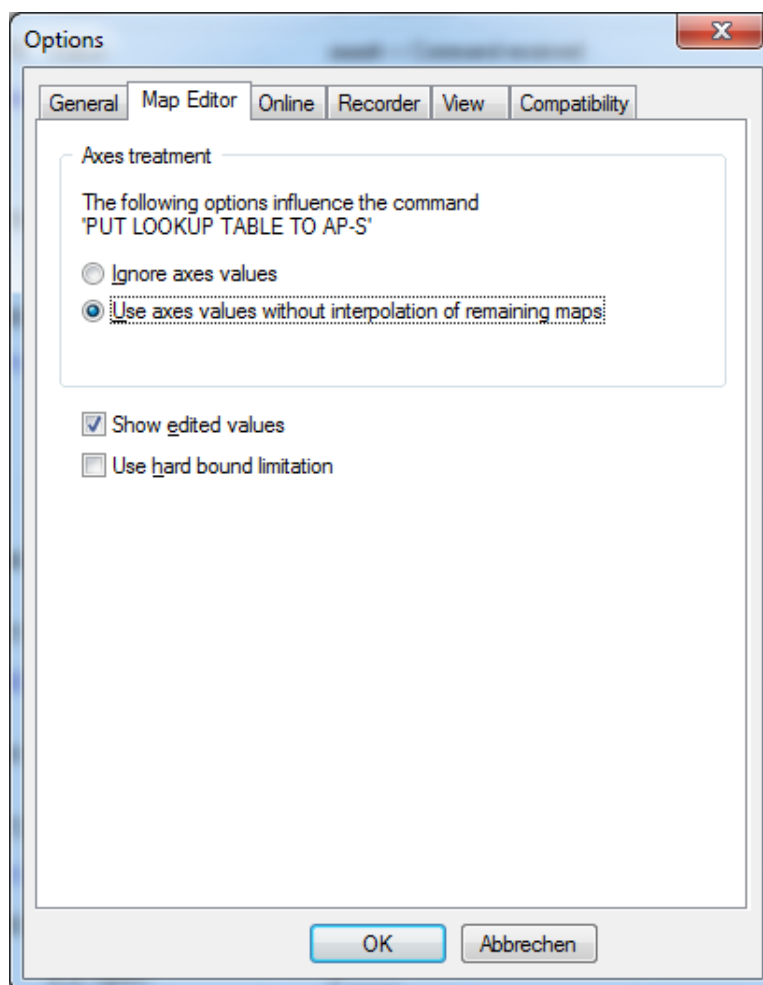
If *Data Download at 'Select Description and Binary File'* is selected, you can choose the option *Create New DS at download within MCS*. If enabled, INCA creates a new data set into which it imports the hex file. If disabled, INCA overwrites the current data set with the imported data.

If *Labels are case sensitive* is set, labels differing only in case are treated as different.

Load differences after switching ignition off/on means that CAN ECUs, which lose their emulation memory contents during power down, are automatically reinitialized with the PCs calibration data by INCA after ignition is switched on.

If *Include timestamp in recorder results* is selected, every call of GET RECORDER RESULTS (Command 46) will return an additional channel with the label "_time_", with the timestamp in ms in float format.

2.6.2 Map Editor Options



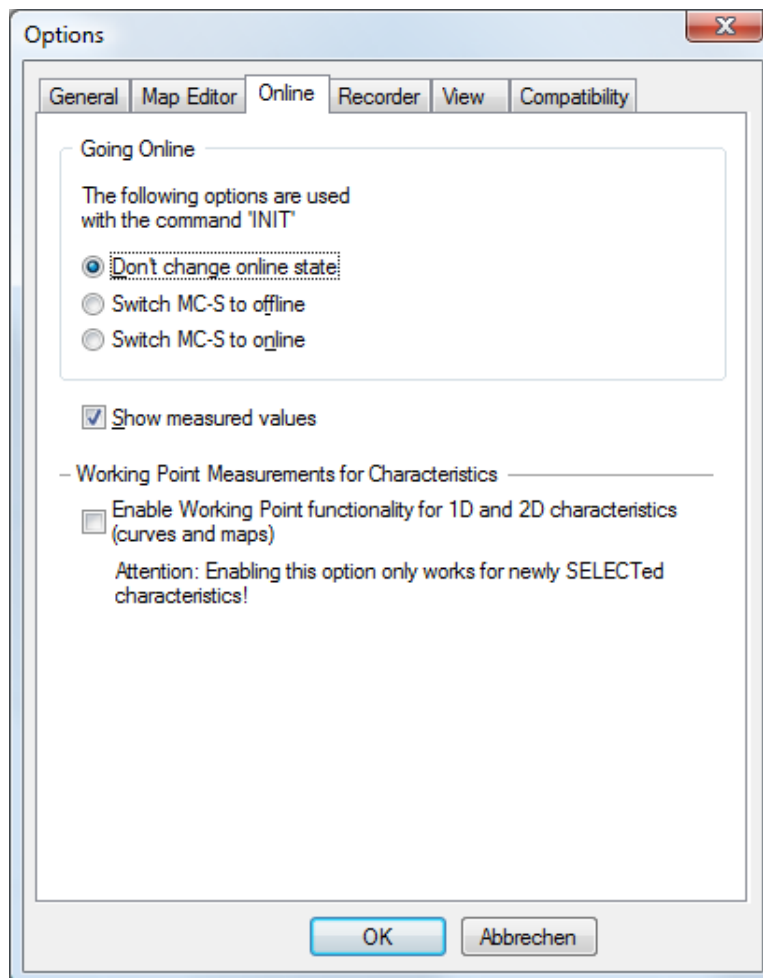
The command PUT LOOKUP TABLE TO AP-S contains besides the data for the map also data for the axes. The user can setup, whether this data for the axes shall be ignored or all the remaining maps shall be used without interpolation.

The default is *Use axes values without interpolation of remaining maps*.

If *Show edited values* is checked, a view is opened for the selected maps or parameters.

If *Use hard bound limitation* is checked and a value of a calibration object, which has to be set, is outside the weak bounds, the weak bounds of the object will be set to the hard bounds. This option allows using the complete range of the hard bounds. The default is that this option is not set, which means that the weak bounds will be used for limitation. If in that case a value outside the weak bounds shall be set, it will be set to the upper or lower weak bound automatically. Additionally the hard bounds (Min./Max. values) will be returned when getting the values of a calibration object via ASAM-ASAP3.

2.6.3 Online Options



Going Online

When the command INIT is sent, the ASAM-ASAP3 can modify the online state of INCA in the following way:

Don't change online state or *Switch MC-S to offline* (measurement and ECU calibration access is stopped) *Switch MC-S to online* (measurement and ECU calibration access is started).

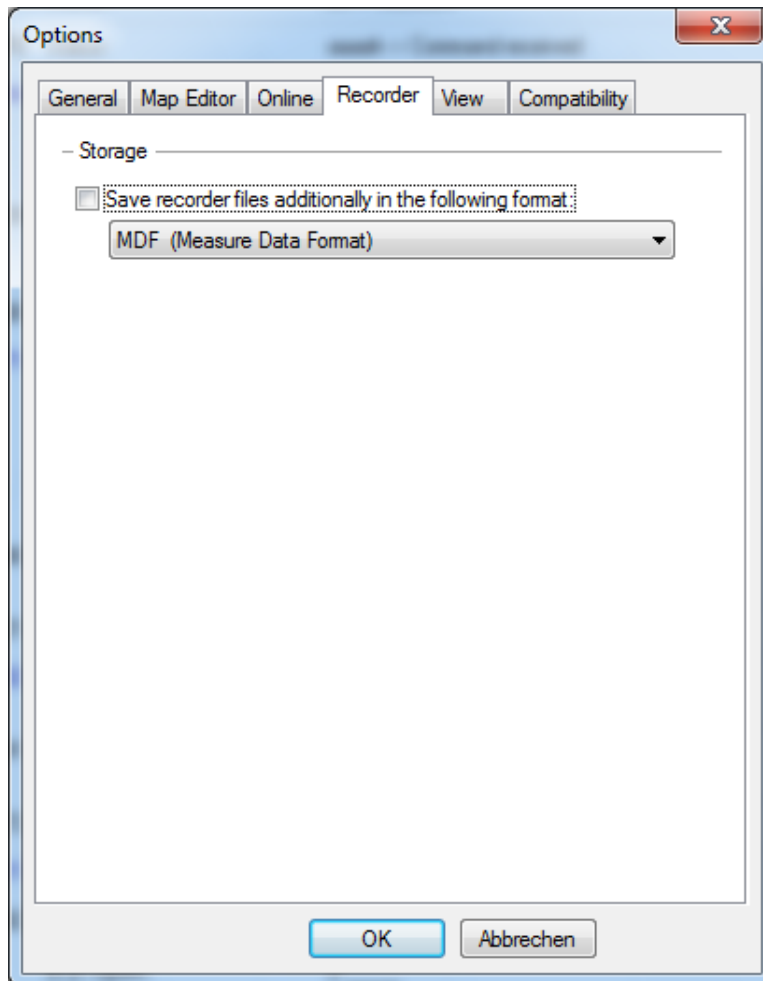
Show measured values

If *Show measured values* is checked, a view is opened for the selected online values.

Working Point Measurements for Characteristics

This option enables or disables the working point functionality which is provided by the EXTENDED GetWorkingPoint command. In case the functionality is disabled, the EXTENDED GetWorkingPoint command will issue an error in case it is executed. If the option is changed, it has only effect on newly selected characteristics, so it is a good strategy to set this option before session start.

2.6.4 Recorder Options



By default the results of every recorder measurement are stored in an MDF (=Measure Data Format) file. With the option *Save recorder files additionally in the following format* it is possible to store every measurement in an alternative format. This is always done additionally to the MDF format, i.e. the MDF file is always written, but if this option is selected, the measurement is additionally stored in another format of choice.

Note: When the Primary Recorder Format in INCA is set to MDF4, it is not possible to store the recorder file in an additional recorder file format.

Background operation of load/save recorder file

The following .reg file defines a registry key that is evaluated by ASAP3.EXE and that enables or disables this new feature:

```
Windows Registry Editor Version 5.00
```

```
[HKEY_CURRENT_USER\Software\ETAS\INCA\6.0\ASAP3\Settings]
```

```
"EnableBackgroundOperations"=dword:00000001
```

In case this key is set to a value different from 0, the new background operation features are enabled. They can be configured via the Recorder Options dialog, which looks like this now: `ACTIVATE RECORDER` with `"STOP"` as a parameter, can implicitly cause a new recorder file to be saved. This save operation can be configured to be executed in the background. Please be aware that with enabled background operation `ACTIVATE RECORDER`, only the native INCA MDF format is supported. The format selection option will be disabled while background operation for `ACTIVATE RECORDER` is enabled.

For each command, enabling and disabling background operation can be performed independently of each other by a separate check box for each command.

An active background operation can cause some commands to return errors because they would conflict with the background operation. These conflicting commands are:

- `ACTIVATE RECORDER`
- `GET RECORDER STATUS`
- `GET RECORDER RESULTS HEADER`
- `GET RECORDERRESULTS`
- `SAVE RECORDER FILE`
- `LOAD RECORDER FILE`

The error code returned in this case will be either

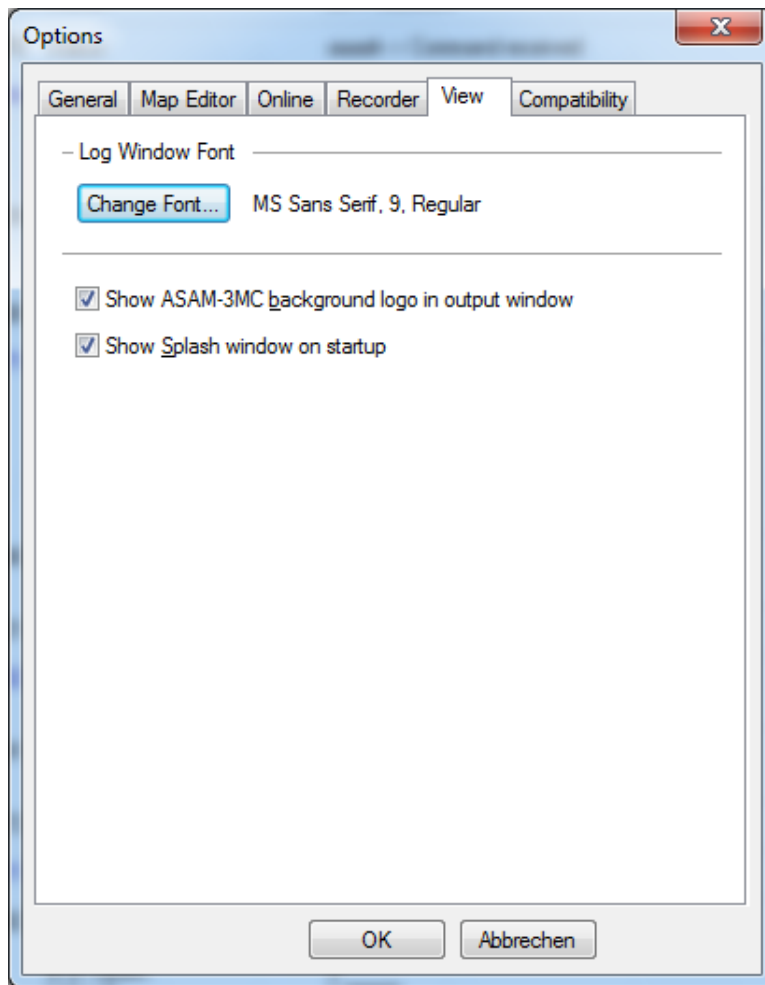
"60832 Command not possible because a 'LOAD RECORDER FILE' command is still running in the background!"

or

"60833 Command not possible because a 'SAVE RECORDER FILE' command is still running in the background!"

depending on whether a load or a save operation is in progress.

2.6.5 View Options



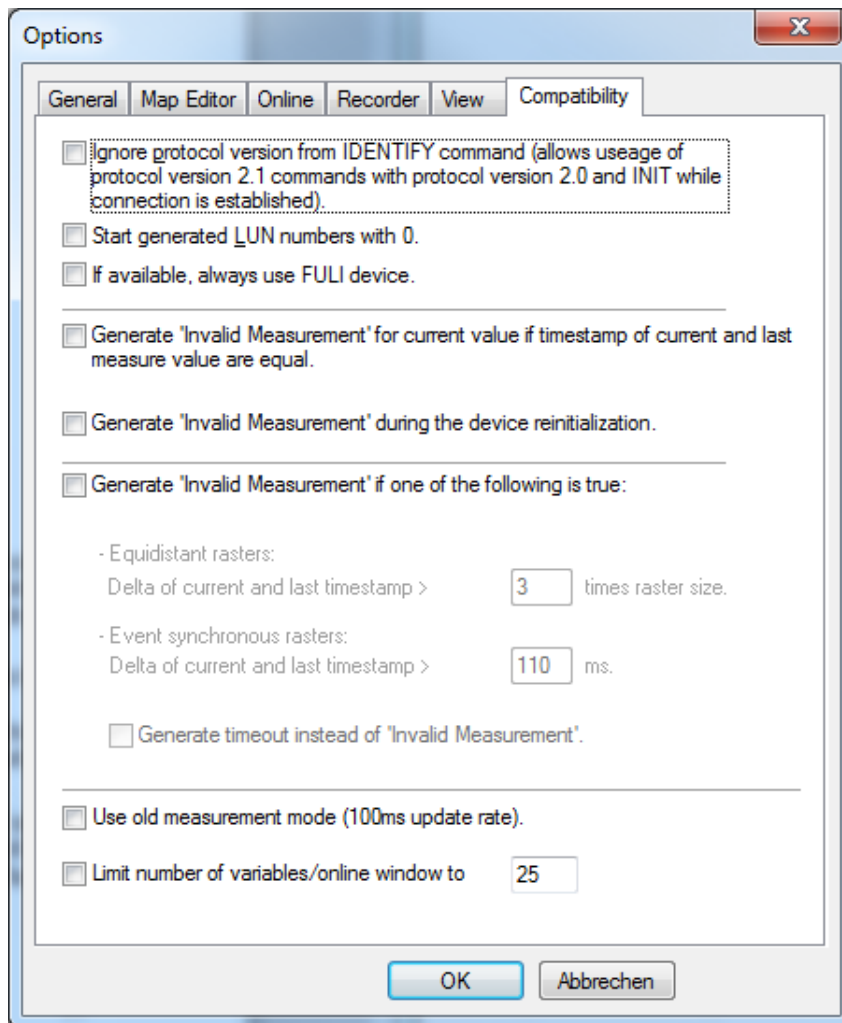
With *Change Font* the user can select the font (-size) used for the output in the log window.

Show ASAM-3MC background logo in output window is helpful for systems with slow graphic adapters, if the scrolling of the log window is very slow. In this case these options should be unchecked.

Show Splash window on startup enables the splash window (default).

2.6.6 Compatibility Options

The following options have been added to allow for greatest compatibility with the previous ASAM-ASAP3 implementations of early INCA versions.



The option Ignore Protocol Version from IDENTIFY command (allows usage of protocol version 2.1 commands with protocol version 2.0 and INIT while connection is established) allows the AuSy to execute protocol version 2.1 commands while identifying itself with protocol version 2.0.

The option Start generated LUN numbers with 0 will force the SELECT DESCRIPTION FILE AND BINARY FILE command and the DEFINE DESCRIPTION FILE AND BINARY FILE command to generate LUN numbers starting with 0 and increased by one. Without this option set, the LUN numbers are starting with 59 and increased by 29 to simulate "arbitrary" numbers.

The option If available, always use FULI device if available defines that all LUNs of devices, that potentially support FULI, will be treated as FULI, regardless of if the used destination code in the commands SELECT DESCRIPTION FILE or DEFINE DESCRIPTION FILE is from the "_FULI" range or not. Recording labels from such FULI LUNs result in recording the labels as if they were from a non-FULI LUN.

The option Generate 'Invalid Measurement' for current value if timestamp of current and last measure value are equal checks if the current measure value is really a new one, and not the last one that was send repeatedly because no newer values are available. By default INCA repeats the latest value until a new one is available. If this checkmark is set, the system reports 'Invalid Measurement' if there is no new measure value.

The option Generate 'Invalid Measurement' during the device re-initialization is off by default, which means that during a device re-initialization the last valid value is (repeatedly) returned. If this value is checked, the value for 'Invalid Measurement' is returned during every device re-initialization.

The option Generate 'Invalid Measurement' if one of the following is true allows to generate an invalid measurement if the measurement data isn't updated for a certain amount of time. Up that time the last valid value is returned. Basically the option differs between 2 raster types:

- Equidistant rasters:
If the delta between the current and the last timestamp exceeds n times the current raster size an invalid measurement value is returned. Example: The value is wired in a 50ms raster and the option is set to 5. In this case after a time of 5 x 50ms = 250ms an invalid measurement is returned.
- Event synchronous rasters:
If the delta between the current and the last timestamp exceeds a certain amount of time in ms an invalid measurement is returned.

Additionally, it is possible to generate a timeout on the client side with the option *Generate timeout instead of 'Invalid Measurement'*. This option is valid for both raster types.

Note:

In a standard installation, the maximum value for equidistant rasters is limited to 1000 ms. It turned out that for the measurement of CAN-Monitoring signals, this limit can be too tight. This is true for signals that are only sent very rarely, e.g. if their value changes or after a certain time span, e.g. 10 seconds, has elapsed.

To avoid invalid measurement values in these cases, the maximum value for equidistant rasters can be overridden in the windows registry. The following reg file specifies a timeout of 5000ms (1388 hex):

Windows Registry Editor Version 5.00

```
[HKEY_CURRENT_USER\Software\ETAS\INCA\7.2\ASAP3\Settings]
"MeasureTimeoutSynchroMaxValue"=dword:00001388
```

Similar thoughts lead to an equivalent feature for the time equidistant rasters. The following registry file specifies a timeout of 6000ms (1770 hex):

Windows Registry Editor Version 5.00

```
[HKEY_CURRENT_USER\Software\ETAS\INCA\7.2\ASAP3\Settings]
"MeasureTimeoutFactorEquidistantMaxValue"=dword:00001770
```

For both Settings to take effect, a restart of ASAP3.EXE is required.

Attention

All these options are only valid during normal operation. After a measurement was started the system always waits up to 1000ms for the first data. If after 1000ms no new data is available the system returns with an INVALID MEASUREMENT error. Once valid data is available, the system will react as defined with the settings before.

With the option *Use old measure mode* it is possible to switch back to the measurement behavior of INCA ASAP3 implementation before INCA 5.3. If this option is switched off, the client is able to retrieve all available measurement data, as long as he polls fast enough, but in this case every data has a fixed delay of n+50ms. Please take a look at chapter 2.8 for more information on measurement modes.

The option *Limit number of variables/online window* limits the number of measurement variables that can be displayed in one experiment view. After that number a new view is opened when adding new measurement variables.

2.7 Usage of ASAP3.INI

With the menu option 'Extras|Export Current Options...' you can save the current settings to an ASAP3.INI file.

The settings in the asap3.ini file can be used with the first start of the ASAM ASAP3 interface as default settings. To enable this function, the asap3.ini file must be copied into the INCA data directory (e.g. \ETASData\INCAx.y). At the end of the first run of the ASAM ASAP3 interface, the settings are stored in the registry:

HKEY_CURRENT_USER\Software\ETAS\INCA\x.y\ASAP3

All later runs of ASAM ASAP3 will load and store the settings at this registry location.

This way, every user has its own ASAM-ASAP3 settings.

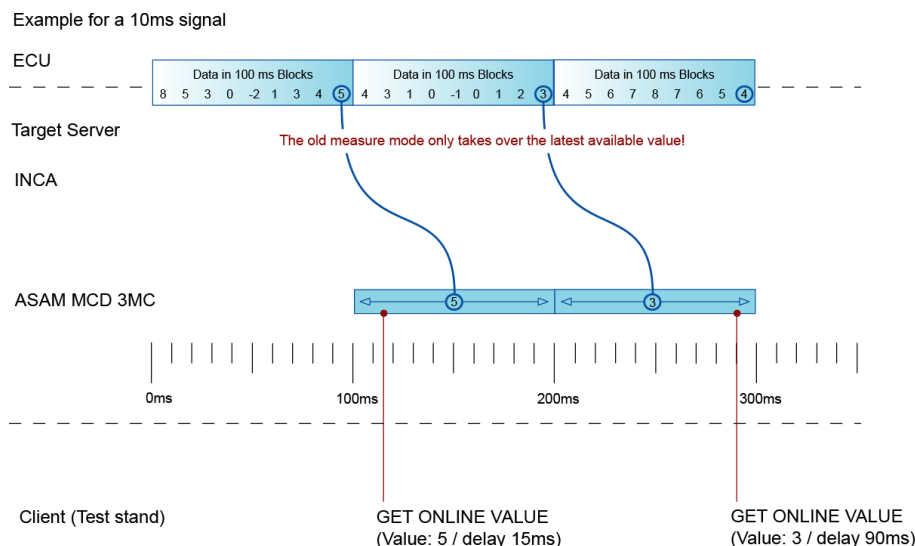
If the settings later shall be replaced again with an ASAP3.INI file, the ASAM ASAP3 registry settings have to be deleted (HKEY_CURRENT_USER\Software\ETAS\INCA\x.y\ASAP3 should not exist anymore). This forces ASAM ASAP3 to reload the settings from ASAP3.INI this time, but again only once.

2.8 Measurement modes

As already mentioned in section 2.6.6 there are 2 possible measurement modes. The former one which has a fixed update rate of 100ms that has been kept for compatibility reasons and a new one that enables the client to get all available data.

2.8.1 Old measure mode (Compatibility mode)

This measurement mode uses a fixed update rate of 100ms (INCA target server update rate in default "High bandwidth" mode). If a client polls he always gets the latest available value. Polling at rates > 10Hz does not really make sense, as in this case only the latest available value is repeatedly handed to the client. The following overview explains the behavior:



The data at the client side are delayed, depending on when the client calls GET ONLINE VALUE. The delay is in the range of 0 - 100ms. Therefore, it is recommended for a client to call at GET ONLINE VALUE at a fixed rate of 10Hz for best performance. Higher rates will result in higher workload, but not in more precise results.

Since INCA 5.3 it is possible to switch between 2 operating modes of the target server:

- High bandwidth mode (the default mode, as in all INCA versions < 5.3, internal update rate: 100ms)

- High performance mode (an alternative mode for INCA 5.3 and above, internal update rate: xxms)

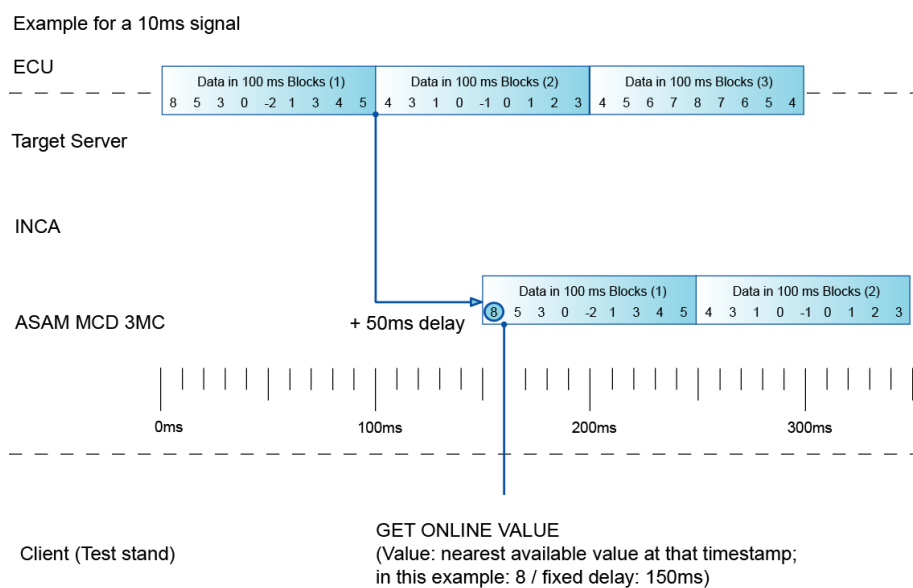
All things said so far are also valid for the high performance mode, with the only difference that the 100ms update rate is changed to xxms and all timings will change accordingly.

But even with the high performance mode is not possible to get all available values of a raster that is faster than the update rate of xxms.

To make it possible to get all values of faster signal a new measure mode was introduced, which is explained in the following section.

2.8.2 New measure mode

With measurement signals at rates faster than the rate of the selected target server mode (for all INCA versions < 5.3 this is 100ms), it is necessary to be able to poll at higher rates. Therefore, a new measurement mode was introduced that allows a client to get the 'in between' data. As the target server delivers the data in 100ms blocks (INCA target server update rate in default "High bandwidth" mode), the data is buffered in the ASAM ASAP3 server of INCA and then returned to the client depending on 'when' it calls GET ONLINE VALUE. The following overview explains again the behavior:



If the user wires a 10ms signal and calls at a certain time GET ONLINE VALUE he gets the value with a fixed delay of 150ms. If he calls GET ONLINE VALUE 10 times in 100ms, i.e. uses a polling rate of 100Hz, he will get all 10 values that were recorded in that frame.

Since INCA 5.3 it is possible to switch between 2 operating modes of the target server:

- High bandwidth mode (the default mode, as in all INCA versions < 5.3, fixed delay at internal update rate + 50ms = 100+50ms = 150ms as in the overview)
- High performance mode (an alternative mode for INCA 5.3 and above, fixed delay at internal update rate + 50ms = xx+50ms = xxms)

Attention
In order to be able to get all values of faster signals it is necessary that the test stand is connected through Ethernet (serial is too slow) and that the server and client (test stand) PC are fast enough to handle the higher workload that is caused by higher polling rates.

Note

Everything said about GET ONLINE VALUE is also true for the Command GET USER DEFINED VALUES.

2.9 Search Mechanism for ASAM ASAP3 Variables

Some ASAM ASAP3 commands need a variable name or a variable name list as parameters. ASAM ASAP3 gets these variables with the following mechanism:

- In most cases the user/automation system knows the variable name and the LUN of the device the variable belongs to. In this case the user takes the LUN and the variable name as parameters.
- If the user/AuSy doesn't know the LUN (in this case he sets the LUN parameter to \$FFFF) the list of all devices is checked, whether one of the devices contains the variable. Note: This mechanism is only supported for measurement variables.
- If the user/AuSy has different variables with different LUN, every variable should have the following form: "variable\device". If in some variables the device name is missing, it is treated like in case I or II.

2.10 Realization of ASAM ASAP3 Commands in INCA

This chapter describes how ASAM ASAP3 commands are executed in INCA.

In the case of unimplemented commands the error code \$5656 is returned.

Error codes:

There are several categories of errors:

- Errors in the communication between ASAM-ASAP3 server and INCA
- Command specific errors (exceeding of limits, invalid handles (LUN, Map numbers),...)
- INCA specific errors like internal table overflows, declaration errors in description file, general communication errors between ETAS HW and external devices and so on; these errors are returned via ASAM ASAP3 with a general description (e.g. command failed), but are logged in more detail in the INCA monitor window.

Attention:

- INCA can work with 32bit integer values. In ASAM ASAP3, a four-byte float format is used, which has a precision of 7 - 8 digits. The 32bit integer values have a precision of 10 digits. Therefore, you will lose precision of data when dealing with 32bit variables.
Most of the EXTENDED commands of ASAM ASAP3 V2.1.x, which would solve the previously mentioned problem, are not yet implemented in the current version.
- Invalid measurements will not be indicated to the AuSy with the current implementation of the tool chain. Only in some cases where the ASAM ASAP3 server cannot get correct data from INCA, the invalid measurement value will be returned.
- The new behavior of default LUN = 0 is implemented like this: LUN 0 will always access the first ECU in the current INCA Workspace.
- Download to some K-Line devices fails because they do not support the download of the full calibration area. Disable download via ASAM ASAP3 and instead do a differential download directly in the INCA UI in this cases before the ASAP3 session is started.
- The commands SELECT DESCRIPTION FILE AND BINARY FILE and DEFINE DESCRIPTION FILE AND BINARY FILE are now able to load a different dataset into the ECU. Only the description file is used to select the device. If you want to use two identical ECUs, you cannot distinguish them by the binary file. Therefore you have to create a copy of the description file with a different name and create a new project within INCA with this renamed description file. Then you can use this two different description file names within ASAM ASAP3 to distinguish the two ECUs.
- If a calibration object in INCA will be changed and this object exists also for a second ECU, it will automatically be changed for both ECUs if *Group Device* was selected before. This feature is also available in ASAM ASAP3.

- Switching Online does not automatically start the measurement. The measurement is started if an ASAM ASAP3 command that requires a running measurement is issued. Nevertheless, the SWITCHING OFFLINE/ONLINE command must still be issued in advance, because the access to the ECU must already be provided when starting a measurement.
The measurement is stopped automatically when a command that requires the measurement to be stopped is issued. This will not be done in case a flight recorder is running. In this case, an error message is returned.
- Normally, the IDENTIFY command is required to use ASAM ASAP3 Version 2.1. Without issuing the IDENTIFY, a MCD system is regarded as a V 2.0 system. In the INCA ASAM ASAP3 server, this behavior can be changed by an option in the "Compatibility" settings. The option allows ignoring the protocol version at all and allowing the V2.1 command even if no IDENTIFY command was sent. Nevertheless, when using the IDENTIFY command with version 2.0, also version 2.0 is reported back in the telegram answer.
- The calibration pages of an ECU can be switched by the EXTENDED Service "Switch Emulation Page". Besides this explicit page switch, some other commands can also change the calibration page in some situations.

The following commands always switch the calibration page to the working page, provided the pages are switchable:

```
SELECT LOOKUP TABLE
SELECT DESCRIPTION FILE AND BINARY FILE
DEFINE DESCRIPTION FILE AND BINARY FILE
```

The following commands switch the calibration page to the working page only once for each command and label:

```
GET PARAMETER FROM AP-S
SET PARAMETER ON AP-S
```

The following commands switch the calibration page to the working page when they access LUN 0:

```
COPY BINARY FILE
CHANGE BINARY FILE NAME
RESET DEVICE
EXTENDED Service "GetToolSetupInfo"
```

The following commands switch the calibration page to the working page when they access LUN0 and there are variables wired that do have no device postfix in their name:

```
PARAMETER FOR VALUE ACQUISITION
DEFINE RECORDER PARAMETERS
```

2.11 Performance considerations

There are several things that should be taken into consideration, to get the maximum performance when working with INCA's ASAM ASAP3 server.

- First of all be sure to use the maximum available speed of the serial interface that is available at the test stand (up to 115200 baud).
- To increase speed when adding new variables with DEFINE RECORDER PARAMETERS (Command 41) and PARAMETER FOR VALUE ACQUISITION (Command 12) be sure, that in the General options dialog (section 2.6.1) the parameter *'Labels are case sensitive'* is checked. Uncheck this option only if you really need case insensitive variable names.

Another possibility to increase speed, especially on slower PCs, is to turn off logging in the view window in the General options dialog (section 2.6.1). To do this, select the item *'Only errors'* in the group *'Logging'*. This will increase the speed especially for repeatedly called commands like GET ONLINE VALUE (Command 19), GET USER DEFINED VALUE (Command 21) or GET RECORDER RESULTS (Command 46).

In cases where logging cannot be disabled, it can be made faster by switching off the *'Show ASAM-3MC background logo in output window'* check in the "View" options tab. The disabling of the *'Update LED Indicators'* in the "General" options tab also increases speed.

2.12 FULI – Fast Upper Level Interface (INCA-MCE)

The FULI configuration enables the selection of measurements and calibration for an alternative data transmission path beside the standard ASAM MCD-3MC interfaces. This is used to configure the measurements and calibration for the ETAS INCA-MCE product.

For INCA's ASAM ASAP3 interface a separate LUN for each standard device has to be used for the transmission via FULI link (see chapter 3.5 and 3.6).

If a measurement value is wired via such a FULI LUN, the label is registered for the FULI device and will be transported via an alternative data transmission link (i.e. INCA-MCE EtherCAT/iLinkRT).

New wiring rules apply. (①, ② = sequence order of execution)

New wiring rules (Add):

A (Norm)	A (FULI)	Action
① measurement		① wire normal
① measurement	② measurement	① wire normal, ② enable FULI
② measurement	① measurement	① wire normal, enable FULI
	① measurement	① wire normal, enable FULI

New wiring rules (Remove):

A (Norm)	A (FULI)	Action
① measurement		① remove
① measurement	② measurement	② disable FULI, remove
② measurement	① measurement	① disable FULI, ② remove
	① measurement	① disable FULI, remove

GET ONLINE VALUE returns the values of all wired variables, despite of FULI or not.

Wiring of FULI variables in the recorder is not supported.

Maps and curves of a FULI-LUN are registered for FULI access when the corresponding SELECT LOOKUP TABLE command is executed. Scalar parameters are registered when they are actively read the first time with a FULI-LUN. Registration needs to be done before going online with the ECU, because when the ECU is online, no change of the registration is possible any more – the configuration is sent to the FULI device just before going online. The AuSy must be aware of this and must create all map handles and access all scalar parameters that it wants to be available at the FULI device before it switches online. This, in addition, means that the FULI device will only receive correct data while INCA is in online state. In offline State, the INCA configuration and the FULI configuration might be different. The option "If available, always use FULI device if available" defines that all LUNs of devices, that potentially support FULI, will be treated as FULI, regardless of if the used device type is _FULI or not. Recording labels from such FULI LUNs result in recording the labels as if they were from a non-FULI LUN.

2.13 INCA GUI

During the use of ASAP3.EXE, that is, while a session is active (INIT-Command was sent and no EXIT command was issued since), the INCA GUI is locked by a message window. The reason for this is, that INCA does not support parallel use of GUI and ASAP3. While it is technically possible to close that message window and use the INCA GUI while an ASAP3 session is active, there are no guarantees about data consistency and correct program operation in such a scenario. If, for example, the measurement configuration is changed in the GUI while ASAP3 has a measurement running, the measurement in ASAP3 is corrupted

(will return wrong measurement values) and could even result in a crash of either INCA or ASAP3.EXE.

Attention:

Because of these possible inconsistencies, it is strongly recommended to not use the INCA GUI during a running ASAP3 session. The only exception should be emergency situations. If the INCA GUI was in fact used by an operator during an ASAP3.EXE session, it is required to stop the ASAP3 session, close ASAP3.EXE, close and reopen the experiment, restart ASAP3.EXE and finally reestablish the session with the AuSy.

Note:

To avoid such inconsistent states, it is suggested that the following sequence of operation is executed in case a manual operation in INCA is required:

- 1. Send the EXIT command from the AuSy to the ASAP3.EXE to terminate the session.*
- 2. Perform the manual interaction within INCA. Do not close the experiment window.*
- 3. Restart the script (e.g. send INIT, IDENTIFY ... from the AuSy to ASAP3.EXE).*

After that, normal operation of INCA/ASAP3/AuSy can continue.

In case the experiment window of INCA needs to be closed, ASAP3.EXE must be closed at the end of step 1 and restarted at the beginning of step 3.

3 Implementation Notes for Commands

3.1 EMERGENCY COMMAND: 1

Command:	Entry	Data type
	Event	WORD

Answer:	Entry	Data type
	No data	-

All connected ECU's in the current INCA Workspace, which support page switching, are switched to the Reference Page. *Event* has to be set to 0.

Note

INIT must be executed before EMERGENCY can be executed.

Error codes:	INCA specific errors
	Not yet identified
	Only Event 0 allowed

3.2 INIT COMMAND: 2

Command:	Entry	Data type
	No data	-

Answer:	Entry	Data type
	No data	-

When an INIT is received although there was already an INIT sent, the ASAM ASAP3 session is reinitialized. This means, that allocated resources are freed; LUNs, map numbers and other implicit states are no longer valid; graphic mode and case sensitivity of labels are reset to the default specified in the options, a running flight recording is cancelled. Objects in the experiment that have been there already before ASAM ASAP3 was started stay in the experiment.

If specified in the settings, INCA is put into online state.

Attention: Make sure that INCA is already using the right workspace/project, because with ASAM ASAP3 it is not possible to change projects.

Error codes:	INCA specific errors
--------------	----------------------

3.3 IDENTIFY COMMAND: 20

Command:	Entry	Data type
	Protocol version number	WORD
	AuSy name	STRING

Answer:	Entry	Data type
	Protocol version number	WORD
	MC system name	STRING

The current implementation of the ASAP3 server requires an ASAM ASAP3 V2.x implementation of the client (test bed). The interface itself works by default according to the ASAM ASAP3 V2.1.1 specification. Therefore it returns the value 2.1 (→ 513) and the current version string of INCA (e.g. "INCA V7.0.0 Protocol Version 2.1"}).

The returned version number is 2.1 for all cases where the AuSy identifies itself using version 2.1 or above. If the AuSy identifies itself using V2.0, the interface adjusts itself to ASAM ASAP3 V2.0 functionality and returns V2.0. If the interface works in V2.0 mode, all commands/behavior newly defined in V2.1 are not available to the AuSy and will result in error messages if requested.

In the case that this command wasn't issued by the client, all following commands, except for *INIT*, are answered with the error code 'This command requires at least Protocol Version 2.1!'.

- EXIT
- DEFINE DESCRIPTION FILE AND BINARY FILE
- GET USER DEFINED VALUE
- GET USER DEFINED VALUE LIST
- QUERY AVAILABLE SERVICES
- GET SERVICE INFO
- EXECUTE SERVICE

The INIT command with LUN equal to 0 is not supported if no IDENTIFY command was issued.

Error codes:	INCA specific errors
	Only Event 0 allowed
	Already Identified
	Command order error! Need command 2 before!

3.4 **EXIT** COMMAND: 50

Command:	Entry	Data type
	No data	-

Answer:	Entry	Data type
	No data	-

All resources that were used by the AuSy will be released in INCA. That means, that all inserted online/flight recorder variables and all opened editor windows caused by the AuSy will be removed/closed.

When flight recorder was used by ASAM ASAP3, just the variables inserted by ASAP3 will be removed; this command will not restore the previous state before using ASAM ASAP3.

This command works the same as the menu item 'ASAP3 Stop!' in the ASAM ASAP3 server window.

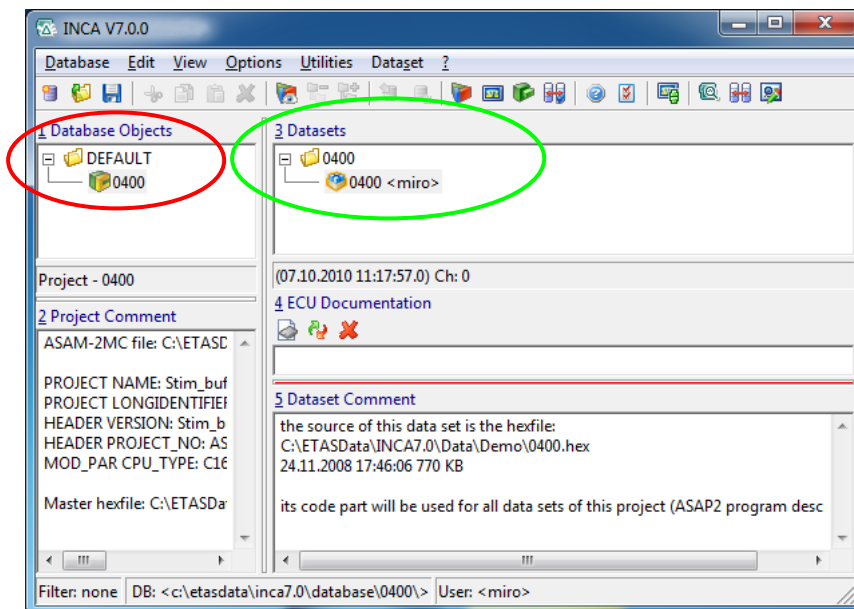
Error codes:	Missing INIT (command 2)
	Only Event 0 allowed

3.5 SELECT DESCRIPTION-FILE AND BINARY FILE COMMAND: 3

Command:	Entry	Data type
	Description file name	STRING
	Binary file name	STRING
	Destination	WORD

Answer:	Entry	Data type
	Emulator LUN	WORD

Depending on the option *Use database names in 'SELECT / DEFINE DESCRIPTION FILE AND BINARY FILE'*, the parameters in this command are treated differently. If the option is checked, the names are treated as database names: The description file name is interpreted as a path and a database item name for the project item in the INCA database, e.g. **DEFAULT\0400**. The same holds true for the Binary File Name, but here the path is interpreted only within the INCA project item, e.g. **0400\0400_1**. The following picture shows how this example looks like in the INCA GUI (left side **Description File Name**, right side **Binary File Name**):



The text further down in this chapter describes the behavior in the case this option is deselected.

Binary File Name has to reference a valid calibration data file, if the option *Data Download at 'Select Description And Binary File'* is enabled. Either it contains only the filename or it contains

also an absolute, full specified path to the file. The default file extension of “.hex” can be overridden. In case the mentioned option is not set, the file needs not to exist on the hard drive, only the INCA database is searched for the name. But the file name must still match the name of the file, which was used when reading the data file.

Description File Name has to reference a valid ASAP2 file. Either it contains only the filename or it contains also an absolute, fully specified path to the file. The default file extension of “.a2l” can be overridden.

Description File Name is only used to select a specific device. *Binary File Name* can be used to load a different binary file with this command. The selection algorithm for the device first compares *Description File Name* to all installed devices. If no one matches, it repeats the comparison with only the filename without path of both the required description file and the description file loaded in each device. If this also fails, the same step is done with the base name (filename without extension) only. If this doesn't succeed, an error is returned.

If the download option is activated and the binary file contains no fully qualified path name, the file is searched in the same directory from which the hex file of the current data set was read. If the hex file cannot be found there, ASAM ASAP3 server searches for the file in the hex file directory which is specified in the user settings. The “current dataset” in this context means the dataset that is currently selected in the device; that is, the one that can be chosen in the menu ‘Dataset|Change Working Data...’.

The value for *Destination* determines the way an ECU is accessed. The currently supported values are:

Destination Code	Destination
0x0	any device (the order the devices are tried is the order in which they are defined in the Workspace)
0x1	ETK
0x2	CAN (CCP-Protocol)
0x3	K-Line (KWP2000, McMess)
0x8000	AUXIN
0x8001	CAN-Monitoring
0x8002	FlexRay-Monitoring
0x8003	XCP (onCAN, onEthernet, onFlexRay,...)
0x8004	CalcDev
0x8005	LIN-Monitoring
0x8006	ODX-Link
0x8100	any FULI device (the order the devices are tried is the order in which they are defined in the Workspace)
0x8101	ETK via FULI
0x8102	CAN (CCP-Protocol) via FULI
0x8203	XCP (onCAN, onEthernet, onFlexRay,...) via FULI

If the option “If available, always use FULI device” is checked, destination codes below 0x8100 lead to LUNs that are treated as FULI devices, as far as the underlying device support FULI at all.

The calibration data are loaded and sent to the ECU by this command if the option *Data Download at 'Select Description And Binary File'* is enabled.

If the option *Data Download at 'Select Description And Binary File'* is enabled, this command loads the specified calibration data in every case (even if it was already loaded into the PC before starting ASAM-ASAP3 server). The previously loaded calibration data is not saved (even if it was modified).

This command cannot be issued a second time after the *INIT* command, when the resulting device would be the same; an error message indicates this.

The ECU for this LUN is switched to the Working Page if more than one calibration page is available in the project used for this ECU.

Error codes:	INCA specific errors
	Missing INIT (command 2)
	Unable to change the "Load differences after switching ignition off/on" option.

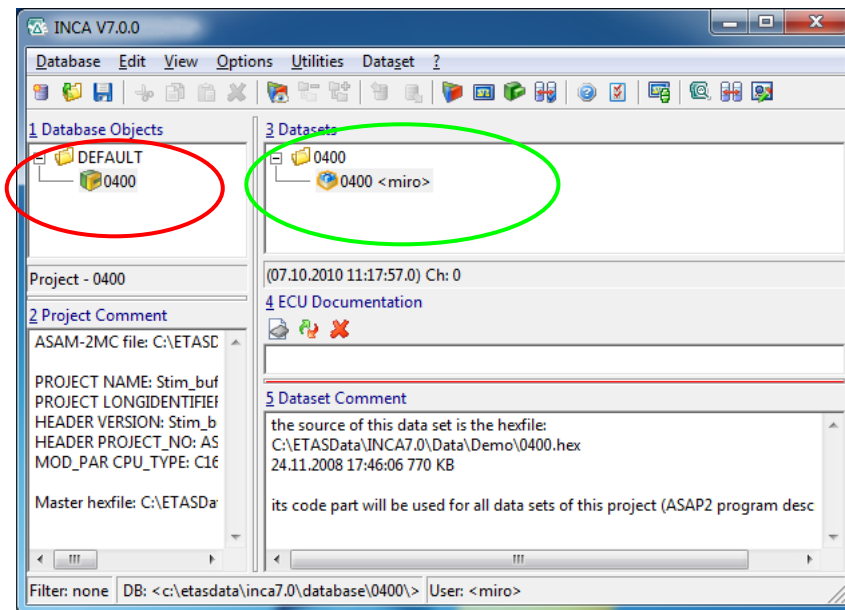
3.6 DEFINE DESCRIPTION-FILE AND BINARY FILE

COMMAND: 30

Command:	Entry	Data type
	Description file name	STRING
	Program code (+Calibration data) file name	STRING
	Calibration data file name	STRING
	Destination	WORD
	Mode	WORD

Answer:	Entry	Data type
	Emulator LUN	WORD
	Description file name	STRING
	Program code (+Calibration data) file name	STRING
	Calibration data file name	STRING

Depending on the option *Use database names in 'SELECT / DEFINE DESCRIPTION FILE AND BINARY FILE'*, the parameters in this command are treated differently. If the option is checked, the names are treated as database names: The description file name is interpreted as a path and a database item name for the project item in the INCA database, e.g. **DEFAULT\0400**. The same holds true for the Binary File Name, but here the path is interpreted only within the INCA project item, e.g. **0400\0400_1**. The following picture shows how this example looks like in the INCA GUI (left side **Description File Name**, right side **Binary File Name**):



The text further down in this chapter describes the behavior in the case this option is deselected.

Program code file name and *Calibration data file name* have to reference a valid program file/calibration data file, if the option "Data Download at 'Select Description And Binary File'" is enabled. Either they contain only the filename or they contain an absolute, fully specified path to the file. The default file extension of ".hex" can be overridden. In case the mentioned option is not set, the files don't need to exist on the hard drive, only the INCA database is searched for the name. But the file names must still match the names of the files which were used during data import.

Description File Name has to reference a valid ASAP2 file. Either it contains only the filename or it contains also an absolute, fully specified path of the file. The default file extension of ".a2l" can be overridden. The file handling is the same as for the Binary File.

Description File Name is only used to select a specific device. *Binary File Name* can be used to load a different binary file with this command. The selection algorithm for the device first compares *Description File Name* to all installed devices. If no one matches, it repeats the comparison with only the filename without path of both the required description file and the description file loaded in each device. If this also fails, the same step is done with the base name (filename without extension) only. If this doesn't succeed, an error is returned.

If a *Mode* value of 2 is used and the binary file contains no fully qualified path name, the file is searched in the same directory from which the hex file of the current data set was read. If the hex file cannot be found there, the ASAM ASAP3 server searches for the file in the hex file directory which is specified in the user settings. The "current data set" in this context means the dataset that is currently selected in the device; that is, the one that can be chosen with the menu 'Dataset|Change Working Data...'.

The field for *Program code file name* will be used if *Calibration data file name* is empty, otherwise it is ignored.

The field for *Calibration data file name* can be blank. In this case, the LUN will directly refer to the first ECU in the INCA Workspace, which matches the description file name. If the Description file name is empty, too, the first ECU in the Workspace will be used.

The value for *Destination* determines the way an ECU is accessed. The currently supported values are:

Destination Code	Destination
0x0	any device (the order the devices are tried is the order in which they are defined in the Workspace)
0x1	ETK
0x2	CAN (CCP-Protocol)
0x3	K-Line (KWP2000, McMess)
0x8000	AUXIN
0x8001	CAN-Monitoring
0x8002	FlexRay-Monitoring
0x8003	XCP (onCAN, onEthernet, onFlexRay,...)
0x8004	CalcDev
0x8005	LIN-Monitoring
0x8006	ODX-Link
0x8100	any FULI device (the order the devices are tried is the order in which they are defined in the Workspace)
0x8101	ETK via FULI
0x8102	CAN (CCP-Protocol) via FULI
0x8203	XCP (onCAN, onEthernet, onFlexRay,...) via FULI

If the option "If available, always use FULI device" is checked, destination codes below 0x8100 lead to LUNs that are treated as FULI devices, as far as the underlying device support FULI at all.

With INCA, *mode* values of 1 and 3 will not be supported, because the program is not supported.

With *mode* equal to 2, the calibration data are loaded and sent to the ECU by this command.

This command loads the specified calibration data in every case (even if it was already loaded into the PC before starting ASAM ASAP3 server). The previously loaded calibration data isn't saved (even if it was modified).

This command cannot be issued a second time after the *INVT* command, if the resulting device is the same; an error message indicates this.

The returned description and calibration data file name will be the name extracted from the device. This is the original file name, which was used during import of the project and calibration data.

The returned file name of calibration file will ALWAYS have an absolute pathname; i.e. it will contain drive, path and file name.

The ECU for this LUN is switched to the Working Page if more than one calibration page is available in the project used for this ECU.

Extended support for measurement-only devices, e.g. ADSCAN, CalcDev, CAN-Monitoring, FlexRay Monitoring

To be able to read in measurement values, the following command will select a specific measurement device and will provide a LUN for it:

Entry	Data type	Value
Description file name	STRING	"_AUXIN_"
Program code (+Calibration data) file name	STRING	<device name>
Calibration data file name	STRING	""
Destination	WORD	0x8000
Mode	WORD	0

The answer for this command will be:

Entry	Data type	Value
Emulator LUN	WORD	<dynamic value>
Description file name	STRING	"_AUXIN_"
Program code (+Calibration data) file name	STRING	<device name>
Calibration data file name	STRING	""

Device name refers to the logical device name used within INCA.

This command has to be executed for every single measurement device that shall be accessed by the AuSy.

The returned LUN can be used with every command that deals with online/recorder variables.

This mechanism is available in addition to the second way to access measurement values, where you simply add the measurement device name at the end of a measurement value name with a LUN which was requested via the standard way.

Error codes:

INCA specific errors
Missing INIT (command 2)
There is already a LUN for the device with this description and binary file assigned!
Invalid value for 'Mode'!
Invalid value for 'Destination'!
No device with given name found
Only the modes 0 and 2 are supported
Unable to change the "Load differences after switching ignition off/on" option.

Examples

To create a LUN for the INCA CalcDev device, use the DEFINE DESCRIPTION AND BINARY FILE command with the following parameters:

Entry	Data type	Value
Description file name	STRING	"_AUXIN_"
Program code (+Calibration data) file name	STRING	"CalcDev"
Calibration data file name	STRING	""
Destination	WORD	0x8000
Mode	WORD	0

For CAN Monitoring, use the name of the respective device instead of "CalcDev", e.g. "CAN-Monitoring:1", like in the following command:

Entry	Data type	Value
Description file name	STRING	"_AUXIN_"
Program code (+Calibration data) file name	STRING	"CAN-Monitoring:1"
Calibration data file name	STRING	""
Destination	WORD	0x8000
Mode	WORD	0

This method works for all devices that allow at least for measurement.

3.7

COPY BINARY FILE

COMMAND: 4

Command:

Entry	Data type
Target	WORD (see Target/Source Code)
Source	WORD (see Target/Source Code)
Emulator LUN	WORD

Answer:

Entry	Data type
No data	-

Target / Source Code:

	ASAP3 definition:	INCA specific assignment:
1	EPROM	currently not implemented (we will not read/write EPROMs/FLASH)
2	FILE	calibration data file (hex)
3	Virtual Emulator Board	PC (INCA database)
4	Physical Emulator Board	emulation memory (e.g. ETK)

The following transitions are possible:

Transitions:	Action:
3 → 2	Save binary file
4 → 2	Receive binary file + Save binary file
4 → 3	Receive binary file
2 → 3	Load binary file
3 → 4	Send binary file
2 → 4	Load & Send binary file

Load binary file: Loads the specified calibration data in every case (even if it was already loaded onto the PC before). The previously loaded calibration data is not saved (even if it was modified).

Save binary file: An existing calibration data file is overwritten without an error message. Trying to overwrite read-only files causes an error message.

Error codes:	INCA specific errors
	Invalid LUN
	Invalid number for Source/Destination

3.8 CHANGE BINARY FILE NAME COMMAND: 5

Command:	Entry	Data type
	New Binary File Name	STRING
	Emulator LUN	WORD

Answer:	Entry	Data type
	No data	-

The new file name is saved at first in a LUN specific memory location in the ASAM ASAP3 interface. With the command *COPY BINARY FILE* with the transitions 4 → 2 / 3 → 2 the saved file name is used to store the calibration data. The transitions 2 → 3 / 2 → 4 can be used to load another calibration data file.

The client (test stand) has to make sure, that the given file name is a valid OS file name; if directory parts are included, the directories must already exist. Relative pathnames are not allowed, they must always be absolute. The standard calibration data directory is the directory where the A2L description file is located. If the calibration file name contains no path, this standard directory is used as path.

Error codes:	Invalid LUN
--------------	-------------

3.9 SELECT LOOKUP TABLE COMMAND: 6

Command:	Entry	Data type
	Emulator LUN	WORD
	Map name	STRING

Answer:

Entry	Data type
Map number	WORD
y-Dimension (ny)	WORD
x-Dimension (nx)	WORD
Address (logging info)	WORD

As map name, the internal item name is expected. Valid map types for this command are 1dim and 2dim maps or arrays respectively matrices. Names of set points are rejected. If the option "Show edited values" is set or the command SET GRAPHIC MODE ON AP-S was used before, the map is opened within INCA if it was not yet opened.

With 1dim maps the value for y-Dim is 1. The address field contains the lower 16 bit of the address read from the description file. The maximal extent for a dimension is 1025. In total a command must not exceed 65534 bytes!

Note

Together with 1 dim / 2 dim maps the associated online values of their axis are always wired. This is necessary for the extended command GET WORKING POINT (Command 42001). They have the same raster priority than values wired with PARAMETER FOR VALUE ACQUISITION (Command 12) and therefore influence the raster of already wired online values. To avoid this it is necessary to call the command SELECT LOOKUP TABLE always before the command PARAMETER FOR VALUE ACQUISITION.

Error codes:

INCA communication errors
Invalid LUN
LUN of AUXIN not allowed
Map name not found
No 1dim or 2dim map
Access of an axis failed
Map dimension has exceeded

3.10 PUT LOOKUP TABLE TO AP-S

COMMAND: 7

Command:

Entry	Data type
Map number	WORD
Map length	WORD
Y(1)	REAL
Y(2)	REAL
:	:
Y(ny)	REAL
X(1)	REAL
X(2)	REAL

:	:
X(nx)	REAL
Minimum Z(i,j)	REAL
Maximum Z(i,j)	REAL
Minimum Increment	REAL
Z[X(1),Y(1)]	REAL
Z[X(2),Y(1)]	REAL
Z[X(3),Y(1)]	REAL
:	:
Z[X(2),Y(5)]	REAL
:	:

Answer:

Entry	Data type
No data	-

The values received from the client are adjusted according to the physical conversion of the description file (not to the value range of the data type, which can be bigger).

In off-line mode, the changes apply only to the data on the PC. They will become effective for the ECU as soon as the system goes on-line.

There are two levels of dealing with axes: ignoring values for axes and transmitting axes without interpolation of the remaining maps that are using these axes. The user can decide between these options in the *Extras/Options/Map Editor* dialog box. The axes values for arrays and matrices will be ignored.

The value of *Map Length* has to be calculated according to the ASAM ASAP3 specification. Every time, the complete map has to be transmitted; no elements at the end of the data block are allowed to be omitted.

The values in the fields *Minimum*, *Maximum* and *Minimum Increment* are ignored.

It is also possible to use this command for objects with rescale axes (RES_AXIS) and curve axes (CURVE_AXIS). In this case only the Z-values will be written, the axes values (X/Y) will be ignored. The command has to be complete concerning the amount of values - this means that also the values for the axes have to be there even if they will not be used (but e.g. they can all be zero). **Note:** No message will be written into the log window which indicates this behavior.

If a map or an axis is write-protected the values will not be updated in the MC system and a message will be written to the log window.

Error codes:

INCA communication errors
Invalid map number
Out of memory
Invalid map length value
Values from the MC system can't be interpreted
Values can't be set in the MC system

Values are out of the limits of the data type

3.11 GET LOOKUP TABLE FROM AP-S

COMMAND: 8

Command:	Entry	Data type
	Map number	WORD

Answer:	Entry	Data type
	Map length	WORD
	Y(1)	REAL
	Y(2)	REAL
	:	:
	Y(ny)	REAL
	X(1)	REAL
	X(2)	REAL
	:	:
	X(nx)	REAL
	Minimum Z(i,j)	REAL
	Maximum Z(i,j)	REAL
	Minimum Increment	REAL
	Z[X(1),Y(1)]	REAL
	Z[X(2),Y(1)]	REAL
	Z[X(3),Y(1)]	REAL
	:	:
	Z[X(2),Y(5)]	REAL
:	:	

Reads the data being located on the PC. The map length is calculated according the ASAM ASAP3 specification. Always the whole map is transmitted. The values for *Minimum* and *Maximum* are the limits of the conversion, not of the data type. For example, if RPM is defined as 0h -> 0.0 and 1FE0H -> 8160.0, the values 0.0 and 8160.0 are returned instead of 0 and 65535 what would be the range of the data type unsigned int. *Minimum Increment* is derived from the conversion.

Error codes:	INCA communication errors
	Invalid map number
	Access of an axis failed
	Values from the MC system can't be interpreted

3.12 GET LOOKUP TABLE VALUE

COMMAND: 9

Command:	Entry	Data type
	Map number	WORD
	Y-Index	WORD
	X-Index	WORD

Answer:	Entry	Data type
	Value	REAL

Indices are starting at 1. *Y-Index* is ignored for 1dim maps.
Returns the value being located on the PC.

Error codes:	INCA communication errors
	Invalid map number
	Index out of limits
	Values from the MC system can't be interpreted

3.13 INCREASE LOOKUP TABLE

COMMAND: 10

Command:	Entry	Data type
	Map Number	WORD
	Y-Index	WORD
	X-Index	WORD
	Y-Delta	WORD
	X-Delta	WORD
	Offset	REAL

Answer:	Entry	Data type
	No data	-

Indices are starting at 1; delta has to be at least 1. Y-Values are ignored for 1dim maps.
The value for *Offset* can be either positive or negative.

The map values are calculated accordingly and are subsequently subject to limit checks (if a value exceeds the range of a physical conversion it is limited accordingly) before the calibration data is modified.

If a map is write-protected the value(s) will not be updated in the MC system and a message will be written to the log window.

Error codes:	INCA communication errors
	Invalid map number

Range error
Values from the MC system can't be interpreted
Values can't be set in the MC system
Values are out of the limits of the data type

3.14 SET LOOKUP TABLE

COMMAND: 11

Command:

Entry	Data type
Map number	WORD
Y-Index	WORD
X-Index	WORD
Y-Delta	WORD
X-Delta	WORD
Value	REAL

Answer:

Entry	Data type
No data	-

Indices are starting at 1; delta has to be at least 1. Y-Values are ignored **with** 1dim maps.
 The map values are set accordingly as far as they don't exceed the limits of the limit checks (if a value exceeds the range of a physical conversion it is limited accordingly).
 If a map is write-protected the value(s) will not be updated in the MC system and a message will be written to the log window.

Error codes:

INCA communication errors
Invalid map number
Range error
Values from the MC system can't be interpreted
Values can't be set in the MC system
Values are out of the limits of the data type

3.15 PARAMETER FOR VALUE ACQUISITION

COMMAND: 12

Command:

Entry	Data type
Emulator LUN	WORD
Scanning time (ms)	WORD
Number of values	WORD
Name of 1st value	STRING
Name of 2nd value	STRING

⋮	⋮
---	---

Answer:

Entry	Data type
No data	-

Opens a *Tool API Measurement* window, if none was opened before. Inserts the variables into the window, if not yet inserted. Already existing values will be rejected.

If the number of elements inserted into the current window exceeds the *Maximum number of elements in one measure window* that can be configured in the experiment (see menu: [Components|ASAM-3MC|Options]), a new window is opened.

With *Number of values* = 0 all online variables, that were inserted by ASAM ASAP3 are removed from the experiment. Online variables that have been configured before, stay in the experiment.

It is also possible to use "variable\device"-name instead of variable names only. This allows wiring of different values with different devices (LUNs) in one step. This is a deviation of ASAM ASAP3 that allows faster setup of measurements with variables from many different devices.

Contrary to ASAM ASAP3 the recording type and scanning time of the latest call for a LUN does **not** overwrite all former settings for the variables of the same LUN! (This only happens in certain cases if a variable is added for recording, see Command 41 *DEFINE RECORDER PARAMETERS* for more information).

Single variables used in a measurement must not be defined more than once, otherwise they will be rejected.

If the time raster for the desired scanning time is already full, the nearest free raster is used to wire the value. If all rasters are used an error is reported.

Attention

If a desired time raster is full, adding of new values lasts longer because every action has to be retried with the next available raster! In the worst case all rasters are checked until an error is reported.

Contrary to ASAM ASAP3 it is also possible to wire a variable with a synchronous raster. In this case the scanning time must be set to 0!

If a variable is already wired as user defined value or recorder value, the rate of that value will override the currently selected one, i.e. our signal is attached to the already wired value. Only recorder values have higher 'timing' priority and would overwrite the existing raster with the desired one (See Command: *DEFINE RECORDER PARAMETERS* for more details).

For CAN-Monitoring and CalcDev (calculated signals) devices the scanning time has no influence, because variables of these devices are always wired in their default raster. In case of wiring problems, no fallback rewiring is done, as the signals can only be wired in a specific raster.

In order to wire measurement values in INCA, it is necessary that the measurement is stopped while doing that. Therefore, the measurement is stopped and restarted again, which leads to a short interruption of online data (at least 100ms – see Command 19: *GET ONLINE VALUE*).

Error codes:

Communication errors
Missing INIT (Command 2)
Missing IDENTIFY (Command 20)

Invalid LUN
Not offline. SWITCHING OFFLINE/ONLINE (Command 13)
Unknown variable

3.16 SWITCHING OFFLINE/ONLINE COMMAND: 13

Command:	Entry	Data type
	Mode	WORD

Answer:	Entry	Data type
	No data	-

This command corresponds to the menu items [Hardware|ECU calibration access (checked)] in case of mode=1 or [Hardware|ECU calibration access (unchecked)] in case of mode=0.

When going online (mode=1) and the calibration data in the INCA database differs from the calibration data in the ECU, INCA database data is automatically downloaded to the ECU.

Contrary to the ASAM ASAP3 V2.0 specification, this command can be executed also without issuing the command *PARAMETER FOR VALUE ACQUISITION* before to be able to modify maps offline.

While executing the command *INIT*, the ASAM ASAP3 interface tries to set the online state according to the [Extras|Options|Online] "Going Online" options.

If maps and parameters have been modified offline, the calibration data should be sent to the emulation memory by going online.

Before switching hardware access, ASAM ASAP3 checks if there is at least one ECU in the workspace which supports at least one calibration page. If this is not the case, hardware access is not changed.

Error codes:	INCA specific errors
	Missing INIT (command 2)
	Invalid value for online mode

3.17 GET ONLINE VALUE COMMAND: 19

Command:	Entry	Data type
	No data	-

Answer:	Entry	Data type
	Number of actual values	WORD
	Value of the 1st actual value	REAL
	Value of the 2nd actual value	REAL
	⋮	⋮

Returns the values of the selected acquisition variables in the order they got configured. If the measurement is not running, it is started before.

If the system was offline before or the measurement was not running, the system waits at least 100ms until it tries to get the values from the INCA target server, otherwise no valid data would be available.

Attention
Calling GET ONLINE VALUE with rates higher than 10Hz only makes sense if the new measure mode is activated (See compatibility options for more information on that).

Note for the new measure mode
If the measurement was started, the system waits up to 1000ms for valid data and then – if still no data is available – returns with an INVALID MEASUREMENT error. This is valid only for the startup phase. Once valid data was available the system will react as configured in the compatibility options (see 2.6.6 for more information).

Error codes:	Communication errors
	Missing INIT (Command 2)
	Missing IDENTIFY (Command 20)
	Not online. SWITCHING OFFLINE/ONLINE (Command 13)
	No online variables defined

3.18 GET USER DEFINED VALUE COMMAND: 21

Command:	Entry	Data type
	No data	-

Answer:	Entry	Data type
	Number of actual values	WORD
	Value of the 1st actual value	REAL
	Value of the 2nd actual value	REAL
	⋮	⋮

If this command (or the command GET USER DEFINED VALUE LIST) is issued, all variables that were manually defined by the user are returned. If the measurement is not running it is started before.

If the system was offline before or the measurement was not running, the system waits at least 100ms until it tries to get the values from the INCA target server, otherwise no valid data would be available.

Attention
Calling GET USER DEFINED VALUE with rates higher than 10Hz only makes sense if the new measure mode is activated (See compatibility options for more information on that).

Note for the new measure mode

If the measurement was started the system waits up to 1000ms for valid data and then – if still no data is available – returns with an INVALID MEASUREMENT error. This is valid only for the startup phase. Once valid data was available the system will react as configured in the compatibility options (see 2.6.6 for more information).

Error codes:	Communication errors
	Missing INIT (Command 2)
	Missing IDENTIFY (Command 20)
	Not online. SWITCHING OFFLINE/ONLINE (Command 13)

3.19 GET USER DEFINED VALUE LIST COMMAND: 22

Command:	Entry	Data type
	No data	-

Answer:	Entry	Data type
	Number of actual values	WORD
	Emulator LUN of 1st value	WORD
	Name of 1st value	STRING
	Emulator LUN of 2nd value	WORD
	Name of 2nd value	STRING
	⋮	⋮

Returns the list of all user defined variables. Always necessary before calling GET USER DEFINED VALUE (Command 21), if values were manually added or removed since the last call.

Error codes:	Communication errors
	Missing INIT (Command 2)
	Missing IDENTIFY (Command 20)

3.20 GET PARAMETER FROM AP-S COMMAND: 14

Command:	Entry	Data type
	Emulator LUN	WORD
	Parameter name	STRING

Answer:	Entry	Data type
	Value	REAL

Minimum value	REAL
Maximum value	REAL
Minimum Increment	REAL

Reads the data located on the PC. The parameter name is the internal name of the description file.

If the option "Show edited values" is set or the command SET GRAPHIC MODE ON AP-S was used before, the parameter is opened within INCA if it was not yet opened. For *Minimum value*, *Maximum value* and *Minimum Increment* see Command 8.

Error codes:

INCA communication errors
Invalid LUN
LUN of AUXIN not allowed
Parameter not found
Object is no parameter
Values from the MC system can't be interpreted

3.21 SET PARAMETER ON AP-S

COMMAND: 15

Command:	Entry	Data type
	Emulator LUN	WORD
	Parameter name	STRING
	Value	REAL

Answer:	Entry	Data type
	No data	-

The values received from the client are adjusted according to the physical conversion of the description file (not to the value range of the data type, which can be bigger).

In off-line mode, the changes only apply to the data on the PC. They will become effective for the ECU as soon as the system goes on-line.

If the option "Show edited values" is set or the command SET GRAPHIC MODE ON AP-S was used before, the parameter is opened within INCA if it was not yet opened.

If a parameter is write-protected it will not be updated in the MC system and a message will be written to the log window.

Error codes:

INCA communication errors
Invalid LUN
LUN of AUXIN not allowed
Parameter not found
Object is no parameter

Values from the MC system can't be interpreted
Values can't be set in the MC system
Values are out of the limits of the data type

3.22 DEFINE RECORDER PARAMETERS

COMMAND: 41

Command:	Entry	Data type
	Emulator LUN	WORD
	Recording type	WORD
	Scanning time [ms]	REAL
	Divider factor	WORD
	Number of values	WORD
	Name of 1st value	STRING
	Name of 2nd value	STRING
	⋮	⋮

Answer:	Entry	Data type
	No data	-

If this command is issued, the current recorder settings are reset. If *recording type* is set to *synchronous to the system interval time*, the *scanning time* is ignored and should be set to 0.

The field *divider factor* of the command is ignored and should be set to 0!

Single variables used in a recording must not be defined more than once, otherwise they will be rejected.

The command can be recalled repeatedly for each LUN. Every LUN can have its own scanning time.

It is also possible to use "variable\device"-name instead of variable names only. This allows wiring different values with different devices (LUNs) in one step. This is a deviation of ASAM ASAP3 that allows faster setup of measurements with variables from many different devices.

Contrary to ASAM ASAP3 the recording type and scanning time of the latest call for a LUN overwrites only the settings of an already wired variable with the same name and LUN (e.g. as user defined variable).

Note

If a variable already exists as user defined value or online value, the time raster of that variable is changed to the current one requested by the recorder setting.

Note

If the time raster for the desired scanning time is already full, an error is reported.

For CAN-Monitoring and CalcDev (calculated signals) devices the scanning time has no influence, because variables of these devices are always wired in their default raster.

By design all values being wired through ASAM ASAP3 in INCA are recorded and an additional index file (with the extension '.dati') is created together with every measurement, containing the names of all channels that were wired for recording. This allows all related commands to return only these variables.

Attention
 If the index file is lost somehow, the commands *LOAD RECORDER FILE* and *GET RECORDER RESULTS* will return all values available in the measurement file, i.e. all variables that were wired with *PARAMETER FOR VALUE ACQUISITION* and *DEFINE RECORDER PARAMETERS* at the time the recording is done.

In order to wire recorder values in INCA, it is necessary that the measurement is stopped while doing that. Therefore, the measurement is stopped and restarted again which leads to a short interruption of online data (at least 100ms – see Command 19: GET ONLINE VALUE).

Error codes:	Communication errors
	Missing INIT (Command 2)
	Missing IDENTIFY (Command 20)
	Invalid LUN
	Not offline. SWITCHING OFFLINE/ONLINE (Command 13)
	Unknown variable

3.23 DEFINE TRIGGER CONDITION COMMAND: 42

Command:	Entry	Data type
	Trigger START	STRING
	Trigger STOP	STRING
	Max. sample number	INTEGER4
	Start delay	INTEGER4
	Stop delay	INTEGER4

Answer:	Entry	Data type
	No data	-

If no trigger condition is used, the strings for Trigger START and Trigger STOP must be empty.

For a manual trigger, the value of Trigger START must be set to "MANUAL".

As INCA does not support a measurement limited by a *max. sample number* the command calculates the recording time in the following way:

$$\text{recording time} = \text{sample rate} * \text{max. sample number.}$$

This works only if an equidistant measurement (*Recording type* = 0) was defined with DEFINE RECORDER PARAMETERS (Command 20), otherwise the parameter is ignored. Furthermore, the Trigger START and Trigger STOP strings must be empty.

All variables must contain the device name in the following way: "variable\devicename".
 Example: "ub\ETK-Testdevice:1"

All variables uses in trigger conditions must have been defined before with the commands *PARAMETER FOR VALUE ACQUISITION* (Command 12) or *DEFINE RECORDER PARAMETERS* (Command 41).

Start delay and Stop delay must be in ms.

Note

If a STOP trigger is defined, it is not possible to use a stop delay. In that case the stop delay should be set to 0.

Attention

There must be blanks before and after all operators in the trigger conditions!

Possible trigger operators are:

- "!" not
- "=" equal
- "<" less than
- ">" greater than
- "<=" less than or equal
- ">=" greater than or equal
- "!=" not equal
- "&" logical and
- "|" logical or
- "up" rising edge and greater
- "down" falling edge and lower

In addition to that, for combining conditions brackets should be always used to be on the save side (e.g.: (A\ETK > 1) & (A\ETK < 2)).

In order to define a trigger condition in INCA, it is necessary that the measurement is stopped while doing that. Therefore, the measurement is stopped and restarted again which leads to a short interruption of online data (at least 100ms – see Command 19: GET ONLINE VALUE).

Error codes:

Communication errors
Missing INIT (Command 2)
Missing IDENTIFY (Command 20)
Invalid LUN
Not offline. SWITCHING OFFLINE/ONLINE (Command 13)
Unknown variable

3.24 ACTIVATE RECORDER

COMMAND: 43

Command:	Entry	Data type
	Mode	WORD

Answer:	Entry	Data type
	No data	-

When using mode=2, the trigger expression set in DEFINE TRIGGER CONDITION (Command 41) will not have any effect.

Error codes:	Communication errors
	Missing INIT (Command 2)
	Missing IDENTIFY (Command 20)
	Missing DEFINE RECORDER PARAM. (Command 41)
	Missing DEFINE TRIGGER CONDITION (Command 42)
	Invalid value for mode.
	Not online. SWITCHING OFFLINE/ONLINE (Command 13)

3.25 GET RECORDER STATUS

COMMAND: 44

Command:	Entry	Data type
	No data	-

Answer:	Entry	Data type
	Recorder Status	WORD
	Current Samples	INTEGER4
	Stop Condition	WORD
	Stop Information	STRING

The value for *Current Samples* is calculated in the following way:

$$\text{current samples} = \text{recorded time} / \text{sample rate}$$

As INCA only provides the recorded time and not the already recorded amount of samples, the value has to be calculated in that way. After the recording has stopped the exact number of recorded samples is available.

Note
In very short measurements the sample count showed with GET RECORDER STATUS during and after a measurement may differ, because there is a little jitter in INCA when starting a recording.

Error codes:	Communication errors
	Missing IDENTIFY (Command 20)

Missing ACTIVATE RECORDER (Command 43)
Not online. SWITCHING OFFLINE/ONLINE (Command 13)

3.26 GET RECORDER RESULTS HEADER COMMAND: 45

Command:	Entry	Data type
	No data	-

Answer:	Entry	Data type
	Start time (Trigger Start) [s]	STRING
	Recording type	WORD
	Scanning time [ms]	REAL
	Divider factor	WORD
	Number of samples	INTEGER4
	Start delay	INTEGER4
	Stop delay	INTEGER4
	Lost samples	INTEGER4
	Max. Phase Error	INTEGER4

Returns the recorder results of the last recorded measurement. This command can not be executed while the recorder is running. After the end of recording, the information comes from a temporary file until it is saved with SAVE RECORDER FILE (Command 47).

If LOAD RECORDER FILE (Command 48) was called prior to this command the data comes from any file that was saved earlier with SAVE RECORDER FILE (Command 47).

Scanning time will be set to 0 if *Recording Type* in DEFINE RECORDER PARAMETERS (Command 41) was set to 1.

Divider Factor will always be set to 1; the values for *Start Delay*, *Stop Delay*, *Lost Samples* and *Max. Phase Error* will always be 0.

Note
The Recording type parameter is not supported and is always reported as 0, because the underlying file formats do not provide this information.

Error codes:	Communication errors
	Missing IDENTIFY (Command 20)
	Recorder is running.

3.27 GET RECORDER RESULTS COMMAND: 46

Command:	Entry	Data type
	Data Packet Number n	INTEGER 4

Answer:

Entry	Data type
Data Packet Number n	INTEGER4
Number of values m	WORD
Value 1 in sample n	REAL
Value 2 in sample n	REAL
Value 3 in sample n	REAL
⋮	REAL
Value m in sample n	REAL

The numbering for Data Packet Number starts with 1!

If Include timestamp in recorder results is selected in the general options dialog, every call of GET RECORDER RESULTS returns one additional value with the label "_time_" that contains the timestamp of the current sample in float format.

LOAD RECORDER FILE normally returns all variables that were stored in the index file that is saved in parallel to the measurement file and has the extension '.dati'. If that index file is not available, all variables contained in the measurement file are returned (see DEFINE RECORDER PARAMETERS for more information on index files).

Error codes:

Communication errors
Missing IDENTIFY (Command 20)
Recorder is running.

3.28 SAVE RECORDER FILE

COMMAND: 47

Command:

Entry	Data type
Filename	STRING

Answer:

Entry	Data type
No data	-

Saves the currently open measurement data in a file. If an additional file format was selected for recording (see Recorder Options for more information on that) that file is additionally saved at the same location as the one given by filename. Beyond that, also the index files with the extension '.dati' are stored at that location (see DEFINE RECORDER PARAMETERS for more information on index files).

Error codes:

Communication errors
Missing IDENTIFY (Command 20)
Recorder is running.

3.29 LOAD RECORDER FILE

COMMAND: 48

Command:	Entry	Data type
	Filename	STRING

Answer:	Entry	Data type
	Number of values	WORD
	Name of the 1 st value	STRING
	Name of the 2 nd value	STRING
	⋮	

Loads a recorder file of a recording that was previously saved with SAVE RECORDER FILE (Command 46). If no path name is given, the ASAM ASAP3 server uses the USERS measurement files path.

If Include timestamp in recorder results is selected in the general options dialog, LOAD RECORDER returns one additional value with the label "_time_" that contains the timestamp of the current sample in float format.

LOAD RECORDER FILE normally returns all variables stored in the index file that is saved in parallel to the measurement file and has the extension '.dati'. If that index file is not available all variables contained in the measurement file are returned (see DEFINE RECORDER PARAMETERS for more information on index files).

Error codes:	Communication errors
	Missing IDENTIFY (Command 20)
	Recorder is running.

3.30 SET GRAPHIC MODE ON AP-S

COMMAND: 16

Command:	Entry	Data type
	Mode	WORD

Answer:	Entry	Data type
	No data	-

This command overrides the options [Extras|Options|Map Editor] "Show edited values" and [Extras|Option|Online] "Show measured values" for the current ASAM ASAP3 session.

Error codes:	Missing INIT (COMMAND 2)
--------------	--------------------------

3.31 RESET DEVICE

COMMAND: 17

Command:	Entry	Data type
	Emulator LUN	WORD

Answer:

Entry	Data type
No data	-

The reset command is sent to the device specified in the command SELECT DESCRIPTION FILE AND BINARY FILE. If this device doesn't support resetting, then no other device is used to reset the ECU. The ECU is put into the reset state for a short time and resumes its previous state afterwards.

This command does nothing for CAN devices/ECUs!

Error codes:

INCA specific errors
Missing INIT (command 2)
invalid LUN

3.32 SET FORMAT COMMAND: 18

Command:

Entry	Data type
Log. data type	WORD
Model	WORD

Answer:

Entry	Data type
No data	-

Coding for log. data type: 0 = all, 1 = maps, 2 = parameters, 3 = online and recorder values

Coding for model: 0 = physical values, 1 = controller (hex) values

Initially, all data are expected and returned in the physical model.

In INCA, physical conversions as well as string conversions are possible. Because ASAM ASAP3 commands accept only real values for setting and returning values, variables with string conversion are always transferred in the controller model, independent of the settings for model. Whether a returned controller model value is signed or unsigned depends on the data type of the individual variable.

The value 2 for *model* is not supported even in ASAM ASAP3 V2.1 mode!

Error codes:

Missing INIT (command 2)
Invalid value for data type
Invalid value for model

3.33 SET CASE SENSITIVE LABELS COMMAND: 61

Command:

Entry	Data type
No data	-

Answer:	Entry	Data type
	No data	-

This command overrides the [Extras|Options|General] "Labels are case sensitive" option for the current session.

Error codes:	Missing INIT (command 2)
--------------	--------------------------

3.34 EXTENDED GET PARAMETER

COMMAND: 114

Command:	Entry	Data type
	Emulator LUN	WORD
	Parameter name	STRING

Answer:	Entry	Data type
	Data type	DATATYPE
	Value	data type
	Minimum value	data type
	Maximum value	data type
	Minimum Increment	data type

Reads the data located on the PC. The parameter name is the internal name of the description file.

If the option "Show edited values" is set or the command SET GRAPHIC MODE ON AP-S was used before, the parameter is opened within INCA if it was not yet opened. For *Minimum value*, *Maximum value* and *Minimum Increment* see Command 8. The data type for those entries is equal to the DATATYPE indicated in the *Data type* field.

The command supports all labels that are defined as "VALUE" (scalar) or "ASCII" (string) in the "Type" parameter of the ASAP2 CHARACTERISTIC element. For "VALUE" labels, only the data types "IEEE-Real" and "IEEE-Real 8" are supported. For "ASCII" labels, only the data type "STRING" is supported. This implies that variables with a textual conversion ("TAB_VERB") will always be handled as "IEEE-Real" and transport the ECU value (corresponding to the ASAP2 "InVal" of "COMPU_VTAB"). This conforms to FORMAT commands "Model" parameter set to 0.

The following data types are supported:

Data Type in ASAP2	Data type in ASAP3
8-Bit integer or 16-Bit integer (with or without sign) or 4-Byte Real	IEEE-Real (4-Byte-Real, single)
32-Bit integer or 64-Bit integer (with or without sign) or 8-Byte Real	IEEE-Real 8 (8-Byte-Real, double)
ASCII	String

For "ASCII" labels, the *Minimum value*, *Maximum value* and *Minimum increment* will deliver empty strings. An empty string consists of a WORD with the value zero.

In case the "ASCII" label is longer than the maximum transportable data in an ASAP3 telegram, the string is truncated at the maximum telegram length and returned to the AuSy.

Error codes:	INCA communication errors
	Invalid LUN
	LUN of AUXIN not allowed
	Parameter name not found
	Object is no parameter
	Values from the MC system can't be interpreted
	No RAMCal device with given name found

3.35 EXTENDED SET PARAMETER

COMMAND: 115

Command:	Entry	Data type
	Emulator LUN	WORD
	Parameter name	STRING
	Data type	DATATYPE
	Value	data type

Answer:	Entry	Data type
	No data	-

The values received from the client are adjusted according to the physical conversion of the description file (not to the value range of the data type, which can be bigger).
 In off-line mode, the changes only apply to the data on the PC. They will become effective for the ECU as soon as the system goes on-line.

If the option "Show edited values" is set or the command SET GRAPHIC MODE ON AP-S was used before, the parameter is opened within INCA if it was not yet opened.

If a parameter is write-protected it will not be updated in the MC system and a message will be written to the log window.

The description for EXTENDED SET PARAMETER regarding supported label types is valid for this command, too.

The data types that are provided by the AuSy must match the data types of the table in EXTENDED GET PARAMETER. For the case of a Physical Representation format, IEEE-Real (8-Byte-Real, double) can be used as well. In case the given "Data type" is incompatible to the data type of the label, e.g. if "Data type" is set to "STRING" but the parameter is only a "VALUE" label, an error Status \$FFFF is returned along with a corresponding error message.

Error codes:	INCA communication errors
	Invalid LUN
	LUN of AUXIN not allowed
	Parameter not found
	Object is no parameter

Values from the MC system can't be interpreted
Values can't be set in the MC system
Values are out of the limits of the data type
The data type is not valid for the parameter.

3.36 EXTENDED PARAMETER FOR VALUE ACQUISITION

COMMAND: 112

Command:

Entry	Data type
Emulator LUN	WORD
Scanning time (ms)	WORD
Number of values	WORD
Name of 1st value	STRING
Name of 2nd value	STRING
⋮	⋮

Answer:

Entry	Data type
Data type of the 1st actual value (physical)	DATATYPE
Data type of the 1st actual value (controller)	DATATYPE
Data type of the 2nd actual value (physical)	DATATYPE
Data type of the 2nd actual value (controller)	DATATYPE
⋮	⋮

Opens a *Tool API Measurement* window, if none was opened before. Inserts the variables into the window, if not yet inserted. Already existing values will be rejected.

If the number of elements inserted into the current window exceeds the *Maximum number of elements in one measure window* that can be configured in the experiment (see menu: [Components|ASAM-3MC|Options]), a new window is opened.

With *Number of values* = 0 all online variables, that were inserted by ASAM ASAP3 are removed from the experiment. Online variables that have been configured in the experiment before, stay in the experiment.

It is also possible to use "variable\device"-name instead of variable names only. This allows wiring of different values with different devices (LUNs) in one step. This is a deviation of ASAM ASAP3 that allows faster setup of measurements with variables from many different devices.

Contrary to ASAM ASAP3 the recording type and scanning time of the latest call for a LUN does **not** overwrite all former settings for the variables of the same LUN! (This only happens in certain cases if a variable is added for recording, see Command 41 *DEFINE RECORDER PARAMETERS* for more information).

Single variables used in a measurement must not be defined more than once, otherwise they will be rejected.

If the time raster for the desired scanning time is already full, the nearest free raster is used to wire the value. If all rasters are used an error is reported.

Attention

If a desired time raster is full, adding of new values lasts longer because every action has to be retried with the next available raster! In the worst case all rasters are checked until an error is reported.

Contrary to ASAM ASAP3 it is also possible to wire a variable with a synchronous raster. In this case the scanning time must be set to 0!

If a variable is already wired as user defined value or recorder value, the rate of that value will override the currently selected one, i.e. our signal is attached to the already wired value. Only recorder values have higher 'timing' priority and would overwrite the existing raster with the desired one (See Command: DEFINE RECORDER PARAMETERS for more details).

For CAN-Monitoring and CalcDev (calculated signals) devices the scanning time has no influence, because variables of these devices are always wired in their default raster. In case of wiring problems, no fallback rewiring is done, as the signals can only be wired in a specific raster.

In order to wire measurement values in INCA, it is necessary that the measurement is stopped while doing that. Therefore, the measurement is stopped and restarted again, which leads to a short interruption of online data (at least 100ms – see Command 119: EXTENDED GET ONLINE VALUE).

In the Answer telegram, contrary to the specification, only physical data types are reported, even for the controller values, because the ASAP3 specification does not define the required encodings for the typical controller data types (e.g. BYTE, WORD, ...)

The commands PARAMETER FOR VALUE ACQUISITION and EXTENDED PARAMETER FOR VALUE ACQUISITION can only be used mutually exclusive at one time. As soon as one of the two commands has been used successfully, using the other command will result in an error. A switch between the two commands is only possible after resetting the value acquisition list, e.g. by calling one of the two commands with the parameter "Number of Variables" set to 0.

The values configured with EXTENDED PARAMETER FOR VALUE ACQUISITION must be read with the command EXTENDED GET ONLINE VALUES. An attempt to use GET ONLINE VALUES for this purpose will result in an error message.

Error codes:

Communication errors
Missing INIT (Command 2)
Missing IDENTIFY (Command 20)
Invalid LUN
Not offline. SWITCHING OFFLINE/ONLINE (Command 13)
Unknown variable
Mixed use of 'STANDARD' and 'EXTENDED' PARAMETER FOR VALUE ACQUISITION and GET ONLINE VALUE commands is not allowed. Please clear the acquisition list before switching command types.

3.37 EXTENDED GET ONLINE VALUE

COMMAND: 119

Command:	Entry	Data type
	No data	-

Answer:	Entry	Data type
	Number of actual values	WORD
	Value of the 1st actual value	REAL
	Value of the 2nd actual value	REAL
	⋮	⋮

Returns the values of the selected acquisition variables in the order they got configured. If the measurement is not running, it is started before.

If the system was offline before or the measurement was not running, the system waits at least 100ms until it tries to get the values from the INCA target server, otherwise no valid data would be available.

Attention

Calling GET ONLINE VALUE with rates higher than 10Hz only makes sense if the new measure mode is activated (See compatibility options for more information on that).

Note for the new measure mode

If the measurement was started, the system waits up to 1000ms for valid data and then – if still no data is available – returns with an INVALID MEASUREMENT error. This is valid only for the startup phase. Once valid data was available the system will react as configured in the compatibility options (see 2.6.6 for more information).

This command can only be used if the command **EXTENDED** PARAMETER FOR VALUE ACQUISITION was used before successfully to set up the acquisition list. If this is not the case, an error message is returned.

Error codes:	Communication errors
	Missing INIT (Command 2)
	Missing IDENTIFY (Command 20)
	Not online. SWITCHING OFFLINE/ONLINE (Command 13)
	No online variables defined
	Mixed use of 'STANDARD' and 'EXTENDED' PARAMETER FOR VALUE ACQUISITION and GET ONLINE VALUE commands is not allowed. Please clear the acquisition list before switching command types.

3.38 EXTENDED QueryAvailableServices

COMMAND: 200

Command:	Entry	Data type
----------	-------	-----------

No data	-
---------	---

Answer:

Entry	Data type
Number of services	WORD
Name of the 1st service	STRING
Name of the 2nd service	STRING
:	:
Name of last service	STRING

Eight services are supported. Therefore, number of services is 8. The names of the supported services are: "Switch Emulation Page", "Get Tool Setup Information", "Set Option", "Get Option", "Get State", "Get Option Information", "Get State Information" and "Read all Calibrations from File".

Error codes:

Missing INIT (command 2)
This command requires at least Protocol Version 2.1

3.39 **EXTENDED** GetServiceInformation COMMAND: 201

Command:

Entry	Data type
Service	STRING

Answer:

Entry	Data type
InfoString	STRING

The following services are supported: "Switch Emulation Page", "Get Tool Setup Information", "Set Option", "Get Option", "Get State", "Get Option Information", "Get State Information" and "Read all Calibrations from File". The returned info specifies the syntax of the services.

Switch Emulation Page:

```
The service "Switch Emulation Page" requires the following parameters:
LUN: <valid LUN number>; PAGE: <valid page number>
The service returns an empty string.
```

Valid page numbers are 0 for the working page and 1 for the reference page.

Get Tool Setup Information:

```
The service "Get Tool Setup Information" requires the following parameters:
LUN: <valid LUN number>; INFO: <meta data identifier>

The service is called with one of the following meta data identifiers and returns
a string with the (LUN specific) information for each given meta data identifier
(the meta data identifier is not part of the returned string):
Description_File_Name: <file name of description file>
```

```

Description_File_Database_Name: <database name of description file>
Binary_File_Name_WP: <file name of binary file of working page>
Binary_File_Name_RP: <file name of binary file of ref. page>
Binary_Database_Name_WP: <database name of binary of working page>
Binary_Database_Name_RP: <database name of binary of reference page>
Device_Name: <name of device that is associated with the selected LUN>
Current_Page: <currently active page number on target, 0 = WP, 1 = RP>
Experiment_Name: <currently active experiment database name>
Workspace_Name: <currently active workspace database name>
Database_Name: <currently active database path name>

```

Set Option:

The service "Set Option" requires the following parameters:

```

MODULE: <MC Tool module name>; MODULEPATH: <MC Tool module path, optional>; LUN:
<LUN for which this option shall be set, optional>; OPTIONNAME: <option name>;
OPTIONVALUE: <new option value>

```

The service returns an empty string.

Please see the "INCA Tool-API Documentation.chm" file under the "SetOption" method of the "Inca" class for further details, e.g. possible values for "MODULE", "OPTIONNAME" and "OPTIONVALUE".

Get Option:

The service "Get Option" requires the following parameters:

```

MODULE: <MC Tool module name>; MODULEPATH: <MC Tool module path, optional>; LUN:
<LUN for which this option shall be retrieved, optional>; OPTIONNAME: <option
name>

```

The service returns a string with the current value of the requested option.

Please see the "INCA Tool-API Documentation.chm" file under the "GetOption" method of the "Inca" class for further details, e.g. possible values for "MODULE" and "OPTIONNAME".

Get State:

The service "Get State" requires the following parameters:

```

MODULE: <MC Tool module name>; LUN: <LUN for which this option shall be retrieved,
optional>; STATENAME: <state name>

```

The service returns a string with the current value of the requested option.

Please see the "INCA Tool-API Documentation.chm" file under the "GetState" method of the "Inca" class for further details, e.g. possible values for "MODULE" and "STATENAME".

Get Option Information:

The service "Get Option Information" requires the following parameters:

```

MODULE: <MC Tool module name>; LUN: <LUN for which this option shall be
retrieved>; OPTIONNAME: <option name>

```

The service returns a string with the current value of the requested option.

Please see the "INCA Tool-API Documentation.chm" file under the "GetOptionInformation" method of the "Inca" class for further details, e.g. possible values for "MODULE" and "OPTIONNAME".

Get State Information:

The service "Get State Information" requires the following parameters:
 MODULE: <MC Tool module name>; LUN: <LUN for which this option shall be retrieved>; STATENAME: <state name>
 The service returns a string with the current value of the requested state.
 Please see the "INCA Tool-API Documentation.chm" file under the "GetStateInformation" method of the "Inca" class for further details, e.g. possible values for "MODULE" and "STATENAME".

Read all Calibrations from File:

The service 'Read all Calibrations from File' requires the following parameters:
 MODULE: CDM; LUN: <LUN for which this option shall be set>; PATHNAME: <path name>
 The service returns an empty string.
 Please see the "INCA Tool-API Documentation.chm" file under the "ReadAllCalibrationsFromFile" method of the "WorkbaseDevice" class for further details, e.g. possible values for "MODULE" and "PATHNAME".

For all services, the following restrictions apply:

The order of the parameters is significant. The parameter names are not case sensitive. The colon has to follow immediately after the parameter name without a blank.

Possible values for LUN are the LUN numbers which have been returned with the commands "SELECT DESCRIPTION FILE AND BINARY FILE" or "DEFINE DESCRIPTION FILE AND BINARY FILE".

Error codes:

Not yet identified
This command requires at least Protocol Version 2.1!
Unknown service
Invalid LUN!
This meta data identifier is only supported for LUNs which refer work base devices (devices with associated data set)

3.40

**EXTENDED
ExecuteService**

COMMAND: 202

Command:	Entry	Data type
	Service	STRING
	Service input parameter	STRING

Answer:	Entry	Data type
	Service output parameter	STRING

This command supports the services "Switch Emulation Page", "Get Tool Setup Information", "Set Option", "Get Option", "Get State", "Get Option Information", "Get State Information" and "Read All Calibrations From File".

The input parameters of this services have to follow the syntax described in the command GetServiceInformation (201).

For all services, the parameters are separated by semicolons.

The services are described in more details here:

Switch Emulation Page:

This service simply switches to the given emulation page for the device which is identified by the given LUN.

Get Tool Setup Information:

This service returns a meta data information string as described in the command `GetServiceInformation` (201). This string describes important aspects of the current tool setup for documentation purposes.

Set Option:

This service changes the current value of a concrete option of the MC Tool. The parameter `MODULE` has to specify the module which contains the option. The optional parameter `MODULEPATH` is only used for the option "Allow Copy On" and can optionally be used to specify a certain CDM configuration object in the INCA database. The optional parameter `LUN` is required by some `MODULEs`, e.g. `HWC`, to identify a certain device inside this `MODULE`. The parameter `OPTIONNAME` is the name of the option that has to be changed. The parameter `OPTIONVALUE` is the value of the new setting.

The 'MC Tool module path' (path in the INCA database to a CDM configuration object) is only needed when INCA shall set the option in a special CDM configuration object. If the path is missing INCA uses the following CDM configuration objects

- If the CDM is open INCA uses the related CDM configuration object
- If an experiment is open INCA uses the CDM configuration object linked to the related workspace (CDM parallel to EE)
- If an experiment is open and there is no CDM configuration object linked to the related workspace INCA creates a CDM configuration object, links it to the related workspace and stores it in the INCA database (default name, same path as the experiment)
- In all other cases INCA responds with an error

For the `MODULE ASAP3`, the only supported `OPTIONNAME` is "AlwaysUseFuliDeviceIfAvailable". The supported `OPTIONVALUES` are "true" and "false".

For all other modules, please refer the "INCA Tool-API Documentation.chm" help file under the "SetOption" method of the "Inca" class for further details.

Example:

"Set Option"

"MODULE: ASAP3; OPTIONNAME: AlwaysUseFuliDeviceIfAvailable;OPTIONVALUE: true"

Get Option:

This service retrieves the current value of a concrete option of the MC Tool. The parameter `MODULE` has to specify the module which contains the option. The optional parameter `MODULEPATH` is only used for the option "Allow Copy On" and can optionally be used to specify a certain CDM configuration object in the INCA database. The optional parameter `LUN` is required by some `MODULEs`, e.g. `HWC`, to identify a certain device inside this `MODULE`. The parameter `OPTIONNAME` is the name of the option that has to be retrieved. The service returns a string with the current value of the option. Numerical values and enumerations are converted to a string representation.

The 'MC Tool module path' (path in the INCA database to a CDM configuration object) is only needed when INCA shall set the option in a special CDM configuration object. If the path is missing INCA uses the following CDM configuration objects

- If the CDM is open INCA uses the related CDM configuration object
- If an experiment is open INCA uses the CDM configuration object linked to the related workspace (CDM parallel to EE)
- If an experiment is open and there is no CDM configuration object linked to the related workspace INCA creates a CDM configuration object, links it to the related workspace and stores it in the INCA database (default name, same path as the experiment)
- In all other cases INCA responds with an error

For the MODULE ASAP3, the only supported OPTIONNAME is "AlwaysUseFuliDeviceIfAvailable". The supported OPTIONVALUES are "true" and "false".

For all other modules, please refer the "INCA Tool-API Documentation.chm" help file under the "GetOption" method of the "Inca" class for further details.

Example:

```
"Get Option"
```

```
"MODULE: ASAP3; OPTIONNAME: AlwaysUseFuliDeviceIfAvailable "
```

Get State:

This service retrieves the current value of a concrete state of the MC Tool. The parameter MODULE has to specify the module which contains the state. The optional parameter LUN is required by some MODULEs, e.g. HWC, to identify a certain device inside this MODULE. The parameter STATENAME is the name of the state that has to be retrieved. The service returns a string with the current value of the state. Numerical values and enumerations are converted to a string representation.

For the MODULE ASAP3, there is currently no supported state.

For all other MODULEs, please refer the "INCA Tool-API Documentation.chm" help file under the "GetState" method of the "Inca" class for further details.

Example:

```
"Get State"
```

```
"MODULE: MEMORYPAGE;LUN: 0;STATENAME: CS_RP_Dataset"
```

Get Option Information:

This service delivers for a concrete option the possible settings. The tool settings are not changed.

Example:

```
"Get Option Information"
```

```
"MODULE: HWC; LUN: 0; OPTIONNAME: ConnectionInterruptBehaviour"
```

Get State Information:

This service delivers for a concrete state the possible states. The tool states are not changed.

Example:

```
"Get Option Information"
```

```
"MODULE: HWC;LUN: 0;STATENAME: CheckOfState"
```

Read all Calibration Files:

Before the test bench executes a script, the ECU parameters must be set to an initial status. This can be done by downloading a complete data set, by calibration of single parameters or by downloading the content of a data exchange file. This service enables the test bench to download a data exchange file. INCA copies the given data exchange file to the working page of the given device.

Precondition: The data exchange file is located where INCA has access to.

Example:

"Read all Calibrations from File"

"MODULE: CDM; LUN: 0; PATHNAME: 'c:\test\my file.cdfx' "

Note: If the path name contains blanks, the path must be enclosed in single or double quotes (apostrophes), e.g. 'path name' or "path name".

Note: It is possible to read calibrations from different file formats CDF, DCM, CVX, PaCo

Error codes:

INCA specific errors
Not yet identified
This command requires at least Protocol Version 2.1!
Unknown service
LUN parameter required for this service
Invalid LUN
LUN of AUXIN device not allowed for this function!
PAGE parameter required for this service
Only page numbers 0 (working page) and 1 (reference page) are supported.
No memory pages supported!
Only one memory page supported!
Invalid meta data identifier.
This meta data identifier is only supported for LUNs which refer to workbase devices (devices with associated data set)
INFO parameter required!
Invalid parameter
The "AlwaysUseFullDeviceIfAvailable" option cannot be changed because this functionality is currently in use.
MODULE parameter required for this service.
STATENAME parameter required for this service.
OPTIONNAME parameter required for this service.
OPTIONVALUE parameter required for this service.
The INCA method Get-/SetOption or GetStatus or GetOption-/GetStatusInfo returns the following error: <i><Followed by a service specific INCA error text></i>
This SVC requires a LUN that represents an INCA Workbase Device - a device that is associated with calibration data.
PATHNAME parameter required!
The SVC "Read all Calibrations from File" failed. Inca reported the following error: <i><Followed by an INCA error text></i>

3.41

EXTENDED
GetWorkingPoint

COMMAND: 42001

Command:	Entry	Data type
	Map number	DWORD

Answer:	Entry	Data type
	Y-Index	WORD
	X-Index	WORD
	Y-Delta	WORD
	X-Delta	WORD

The working point of the specified map will be returned.

Indices within the map are starting at 1. *Delta* can have one of the values 0, 1 and 2. The value 1 is returned if the working point is lying exactly on a set point value. The value 2 indicates that the associated online value of an axis is currently between the position defined by *Index* and the lower-right neighboring values.

If the working point is not located within the map, the values for the indices will be set to the lowest or highest value possible according to the map dimension. The values for delta will be set to 1.

For 2dim maps, each direction is handled independently; that means that if e.g. the working point is outside the valid range just for the x direction, only these values are set to the lowest or highest value possible.

There are different map types. These types are:

- Maps without any working point or 2dim maps with only one associated online variable.
For these maps, 0 will always be returned for all the values.
- Maps with interpolation between neighboring values.
For these maps, if the working point is valid, the delta values will be either 1 or 2!

If the application system is not on-line, the value 0 for all fields will be returned.

Y-Values have to be ignored for 1dim maps.

It is not possible to use this command for arrays and matrices.

To be able to retrieve the working point at any time after a map number was created, the measurement variables for the working point are already wired during map selection. Since this costs measurement bandwidth even if the working point is never requested, starting with INCA 7, a new option allows enabling and disabling the working point feature globally (refer to chapter 2.6.3 Online Options). In case the working point feature was disabled, an error is emitted when this command is executed.

Error codes:

INCA communication errors
Invalid map number
Access of an axis failed
Values from the MC system can't be interpreted
Values are out of the limits of the data type
The access to the working point data is not possible because the feature is currently disabled in the ASAP3 options.

3.42 Known Problems

In INCA, it is not possible to have the same description file (A2L) and data set assigned to two different ECUs at the same time. If the currently used INCA Workspace contains more than one device, and two or more of those devices are "compatible", e.g. can have the same INCA project and data set assigned, the attempt to assign the same INCA project (=description file) and data set (=calibration data or binary data) to a device (by using DEFINE DESCRIPTION-FILE AND BINARY FILE) while those are already assigned to another device within INCA, will fail.

Workaround: Select a different data set to the second device – either via the MCD3-Client or via the INCA GUI - even if this device is not further used in the current session.

4 Appendix: ASAP3 Error Codes

4.1 Errors in Log Window without Error Code returned to AuSy

The following errors are displayed in the log window without a separate error code returned to the AuSy (Automation System).

Error code	Description
20003	<p>(%s error; unexpected end of command) (replace %s with anyone of: STRING, BYTE, WORD, INTEGER4, REAL) The command received from the AuSy or the response to be sent to the AuSy is malformed. This was detected while trying to log the command or response. If this happens for a command, either the communication link is not reliable enough or a programming error on the AuSy side caused the problem. If this happens for a response, a programming error within ASAP3.EXE caused the problem.</p>
20005	<p>Unknown command: %u(%xh) (replace %u with a decimal number and %x with a heximal number) The command with the given number is not recognized by ASAP3.EXE. This is either one of the unsupported extended commands or an erroneous telegram sent by the AuSy side.</p>
20014	<p>Environment of was changed interactively This message is shown if the connection is currently being stopped by the user and another command is received from the AuSy or if there was no correct initialization with the INIT command.</p>
20050	<p>Cannot log map because of unknown map number! This message is displayed during the command PUT LOOK-UP TABLE if that command asks for a map number which is not known in the current list of selected maps (via SELECT LOOK-UP TABLE).</p>

4.2 Errors in Log Window with Error Code returned to AuSy

Answers of ASAP3.EXE to the AuSy may be affirmative or negative. The affirmative answers are given with a status code of 0x0000 or 0x1232. Negative answers have one of the following states:

Status code (hex)	Description
0x0000	<p>Success <i>(ASAP3 spec: Faultless execution of the last command)</i></p>
0x1232	<p>Success <i>(ASAP3 spec: Faultless execution of the last command)</i></p>

Status code (hex)	Description
0x2343	<p>Environment of INCA was changed interactively. <i>(ASAP3 spec: Value \$2343 indicates that the last sent telegram was not processed and that the AuSy must again set up communication, as interactively major changes have been made to the MC system configuration predefined by the AuSy. The successful execution of the 'INIT' command (Code 2) resets this status (see 'User command "START"' in the section on 'some command sequences').)</i></p> <p>In INCA, this telegram indicates that there was no INIT command before the last command. This can happen if the ASAP3 server was reset or restarted or the communication was reestablished without the AuSy's knowledge.</p>
0x2344	<p>Measuring data list has changed <i>(ASAP3 spec: Measuring data list has changed)</i></p> <p>This status can occur in the response to the GET USER DEFINED VALUE in case the user has changed INCAs list of measured values.</p>
0x3454	<p>Success – simulation mode <i>(ASAP3 spec: A \$3454 status informs the AuSy that the MC system is in simulation mode. The status is interpreted in the subsequent processing as an '0' or '\$1232' status (faultless command execution).)</i></p> <p>INCA does not support simulation mode, so this status will never occur.</p>
0x5656	<p>Command not implemented <i>(ASAP3 spec: This status informs the AuSy of the non-availability of the function of the last sent command.)</i></p> <p>This status occurs if INCA receives the commands EXIT, DEFINE DESCRIPTION AND BINARY FILE, GET USER DEFINED VALUE, GET USER DEFINED VALUE LIST and ASAP3 protocol mode is not 2.01 or higher (e.g. no IDENTIFY command was sent).</p> <p>This status also occurs if an unknown command or an unimplemented extended command was received.</p>
0xFFFF	<p>Error <i>(ASAP3 spec: An error occurred during the processing of the last AuSy command sent to the MC system. An error number and a detailed error message in clear text are sent by the MC system to the AuSy.)</i></p> <p>INCA shows further error codes and error text in the description part of the answer telegram. Please see next table for a detailed description of those error codes</p>
0xAAAA	<p>Command received <i>(ASAP3 spec: This status is considered as an acknowledgement of the last command by the AuSy. The final answer of the MC system occurs after the command has been processed (see telegram above).)</i></p> <p>This status is returned if the option "Send Acknowledge" on the General option tab is checked. It indicates that a command was received from the AuSy. The command will be executed right after the telegram with status 0xAAAA was sent to the AuSy. The answer telegram for the command will be sent after the command was executed (or aborted due to an error). This means, the flow control on the AuSy must depend on the status of the final answer to the command; the 0xAAAA telegram is only an interims indicator that INCA is still communicating.</p>

Status code (hex)	Description
0xEEEE	Retry command (ASAP3 spec: In conjunction with command code 0 in the AuSy RETRY telegram, this status may be considered as a command repeat request (see telegram above).)

The following errors are displayed in the log window (if logging of at least errors is enabled) and returned in the response to the AuSy, except where explicitly stated differently. These errors are contained in answer telegrams that have a status field with the value 0xFFFF.

Error code (decimal)	Description
60001	Invalid LUN! The LUN of the command was not provided by the ASAP3 interface since the last INIT command. If you get this message you should first check the option "Start generated LUN numbers with 0" in the Compatibility page of the Options. Normally LUN numbers start from 59. A script that expects the LUN numbers starting from 59 will cause this error if the above option is set and vice versa. PARAMETER FOR VALUE ACQUISITION DEFINE RECORDER PARAMETERS SELECT LOOK-UP TABLE
60003	Command order error! Missing INIT (command 2)! One of the commands IDENTIFY, SELECT DESCRIPTION AND BINARY FILE or DEFINE DESCRIPTION AND BINARY FILE was sent without a prior call to the INIT command. This violates the required sequence of setting up a connection: INIT IDENTIFY and then SELECT DESCRIPTION FILE AND BINARY FILE or DEFINE DESCRIPTION AND BINARY FILE.
60004	Cannot work with ASAP3 protocol versions different than V2.x! This error message is shown in case one of the commands SELECT DESCRIPTION FILE AND BINARY FILE or DEFINE DESCRIPTION AND BINARY FILE have been called but no IDENTIFY command was sent before. ASAP3.EXE supports only ASAP3 protocol versions 2.x. You archive best results, that is, you get the most features if you identify with version 2.1.
60005	Cannot send calibration data to EPROM! This error indicates that INCA does not support sending calibration data to the EPROM via ASAP3 with the command COPY BINARY FILE. The <i>Target</i> parameter of this command should not be set to 1 (EPROM). COPY BINARY FILE
60006	Cannot receive calibration data from EPROM! This error indicates that INCA does not support receiving calibration data from the EPROM via ASAP3 with the command COPY BINARY FILE. The <i>Source</i> parameter of this command should not be set to 1 (EPROM). COPY BINARY FILE

Error code (decimal)	Description
60007	<p>Invalid values for source or destination!</p> <p>The error appears if the command COPY BINARY FILE was used with invalid parameters for <i>Source</i> and/or <i>Destination</i>. The values for these parameters must not be zero nor exceed the value of 4.</p> <p>COPY BINARY FILE</p>
60008	<p>Already identified!</p> <p>The command IDENTIFY was sent again, after another IDENTIFY command has been sent already, without an INIT or EXIT command in-between.</p> <p>To prevent this error, send an INIT command before the IDENTIFY command.</p> <p>IDENTIFY</p>
60009	<p>Need an ASAP3 protocol version V2.x!</p> <p>The command IDENTIFY was sent with a parameter <i>Protocol version number</i> set to a version smaller than 2.0 or greater or equal to 3.0. To prevent this error, use only variants of version 2 (2.xx), because those are the only ones that are supported.</p> <p>IDENTIFY</p>
60010	<p>Not yet identified! Missing IDENTIFY (command 20)!</p> <p>Received a command without the command IDENTIFY being issued before. IDENTIFY is required to check the protocol version. ASAP3 protocol version 1.0 doesn't send the command IDENTIFY. It is possible to suppress this message with the option "Ignore protocol version from IDENTIFY command..."</p> <p>With this option set it is possible to use protocol version 2.1 commands with protocol version 2.0 without the need of calling IDENTIFY.</p> <p>GET USER DEFINE VALUE LIST GET USER DEFINED VALUE PARAMETER FOR VALUE ACQUISITION GET ONLINE VALUE DEFINE TRIGGER CONDITION ACTIVATE RECORDER GET RECORDER STATUS GET RECORDER RESULTS HEADER GET RECORDER RESULTS SAVE RECORDER FILE LOAD RECORDER FILE</p>
60012	<p>Out of memory!</p> <p>There is not enough memory to create the memory representation of a map. Check the memory in the task manager and quit all applications you don't need.</p> <p>PUT LOOK-UP TABLE</p>
60013	<p>Call was canceled; operation wasn't completed by MCS!</p> <p>INCA did not complete a COM call and the user terminated the communication by clicking "Abort" on the dialog box COM shows after a certain timeout was reached while COM waited for INCA. Since this COM dialogs are disabled, the error should never show up.</p>

Error code (decimal)	Description
60014	<p>Internal error: <individual error text></p> <p>This is a general error message for all exceptions that can occur during operation, mostly exceptions from external applications. The reason for this error is an unexpected behavior of one of the used subcomponents. Therefore, there is no general help how to avoid this type of error. Often a restart of the whole system can help. Otherwise, you should contact the local support for help.</p>
60016	<p>For 'Event', only 0 is allowed!</p> <p>This error occurs if the ASAP3 command EMERGENCY is called with the parameter <i>Event</i> set to a value different from zero. Only the event value 0 is supported by INCA.</p> <p>EMERGENCY</p>
60017	<p>Invalid map number!</p> <p>The map number of the command was not provided by ASAP3 since the last INIT command.</p> <p>GET LOOK-UP TABLE PUT LOOK-UP TABLE GET LOOK-UP TABLE VALUE SET LOOK-UP TABLE INCREASE LOOK-UP TABLE GET WORKING POINT</p>
60020	<p>Invalid structure of received command!</p> <p>The last received command telegram was analyzed and found to have not the correct length. Please check on the sending side that the correct command telegrams are sent. This error can occur for all commands that contain additional data besides the <i>command code</i>.</p>
60021	<p>There is already LUN %d for the device with this description and binary file assigned!</p> <p>The command SELECT DESCRIPTION FILE AND BINARY FILE or DEFINE DESCRIPTION FILE AND BINARY FILE has been executed with parameters that lead to a device for which a LUN has already been assigned. Please check the given description file or device name and the devices for which a LUN already has been generated.</p> <p>SELECT DESCRIPTION FILE AND BINARY FILE DEFINE DESCRIPTION FILE AND BINARY FILE</p>
60023	<p>Map name not found in description file!</p> <p>The map name specified in the command SELECT LOOK-UP TABLE couldn't be found in the description file currently loaded for the given LUN.</p> <p>SELECT LOOK-UP TABLE</p>
60024	<p>Name found in description file but it is no 1dim or 2dim map!</p> <p>The map name specified in the command SELECT LOOK-UP TABLE was found in the description file currently loaded for the given LUN, but is not a 1- or 2-dim map. Possibly the name was a parameter, a set point or a 3-dim map.</p> <p>SELECT LOOK-UP TABLE</p>

Error code (decimal)	Description
60025	<p>Invalid value for data type!</p> <p>The command SET FORMAT was used with an invalid parameter <i>Log. data type</i>. The parameter was larger than the maximum value of 3. Please use a valid value of 0 to 3 instead.</p> <p>SET FORMAT</p>
60026	<p>Invalid value for model!</p> <p>The command SET FORMAT was used with an invalid parameter <i>Model</i>. The parameter was larger than the maximum value of 2. Please use a valid value of 0 to 2 instead.</p> <p>SET FORMAT</p>
60027	<p>Answer packet is too long! Data will be clipped!</p> <p>This message can appear in the log file in the case the answer telegram would grow beyond its maximum size of 65534 Bytes. In that case, all additional data is dropped.</p> <p>The message is shown only in the log file, the client will receive the telegram with the clipped data.</p>
60028	<p>Map has already been selected!</p> <p>Received the command SELECT LOOK-UP TABLE with a map that already has been selected since the last INIT command.</p> <p>SELECT LOOK-UP TABLE</p>
60030	<p>A map dimension has exceeded the limit of 1025!</p> <p>Received the command SELECT LOOK-UP TABLE, that resulted in a map with at least one dimension above 1025 (either x- or y-dimension).</p> <p>SELECT LOOK-UP TABLE</p>
60031	<p>Invalid value for online mode!</p> <p>The command SWITCHING ONLINE/OFFLINE was called with an invalid value for parameter <i>Mode</i>. Please use only values 0 (OFF-LINE) or 1 (ON-LINE).</p> <p>SWITCHING ONLINE/OFFLINE</p>
60033	<p>An unsupported function has been called!</p> <p>There was a call to a COM object with a function that is not supported in the COM object (CNotSupportedException). This is either a version incompatible with INCA or a problem of the installation of INCA. Please start INCA before you start the ASAP3 session. If the error persists, try to reinstall INCA.</p>
60034	<p>An unspecified error occurred!</p> <p>There was a call to a COM object that caused an exception which is not specified in more detail. The additional error text should give additional information about the root cause. Most likely the system reached an unrecoverable error state. Please restart the system.</p>

Error code (decimal)	Description
60035	<p>LUN of AUXIN device not allowed for this function!</p> <p>An AUXIN device does not contain calibration values. Therefore, it is not possible to use AUXIN device LUN numbers together with calibration commands.</p> <p>SELECT LOOK-UP TABLE GET PARAMETER SET PARAMETER</p>
60036	<p>Invalid value for 'Mode'!</p> <p>The mode parameter can only have the values 0 (=Recorder stop), 1 (=Activate Recorder) or 2 (Start Recorder). Every other value will cause this error.</p> <p>ACTIVATE RECORDER</p>
60037	<p>Invalid value for 'Destination'!</p> <p>The command DEFINE DESCRIPTION AND BINARY FILE was called with an invalid value for parameter <i>Destination</i>. Please use a valid value (see description of command).</p> <p>DEFINE DESCRIPTION AND BINARY FILE</p>
60042	<p>Invalid value for 'Recording type'!</p> <p>The recording type parameter can only have the values 0 (= equidistant raster) or 1 (= sync. raster). Every other value will cause this error.</p> <p>DEFINE RECORDER PARAMETERS</p>
60045	<p>ASAP3 command DEFINE RECORDER PARAMETERS has to be called before!</p> <p>No recorder parameters were defined so far. Please call DEFINE RECORDER PARAMETERS before calling the current command.</p> <p>ACTIVATE RECORDER DEFINE TRIGGER CONDITION</p>
60047	<p>ASAP3 command DEFINE TRIGGER CONDITION has to be called before!</p> <p>No trigger condition was defined so far. Please call DEFINE TRIGGER CONDITION before calling the current command.</p> <p>ACTIVATE RECORDER</p>
60048	<p>ASAP3 command ACTIVATE RECORDER has to be called before!</p> <p>If the recorder was not started with ACTIVATE RECORDER (1 or 2), it is not possible to stop the recorder with ACTIVATE RECORDER (0) or retrieve the recorder status with GET RECORDER STATUS.</p> <p>ACTIVATE RECORDER GET RECORDER STATUS</p>
60049	<p>Internal error: invalid date/time!</p> <p>The timestamp within a measurement file was not valid.</p> <p>GET RECORDER RESULTS HEADER</p>
60052	<p>'Start delay' must be 0 or negative!</p> <p>INCA only supports negative start delays (or none) over ASAP3. This is a limitation of the INCACOM interface.</p> <p>DEFINE TRIGGER CONDITION</p>

Error code (decimal)	Description
60061	<p>ASAP3 command SWITCHING OFF/ONLINE with Mode=1 has to be called before!</p> <p>System must be online for the current command.</p> <p>GET ONLINE VALUE GET USER DEFINED VALUE</p>
60200	<p>Error switching to work page.</p> <p>INCA rejected to switch to the working page. Please see the Monitor Window for additional information about this problem.</p> <p>SELECT DESCRIPTION FILE AND BINARY FILE DEFINE DESCRPTION FILE AND BINARY FILE EXTENDED ExecuteService</p>
60201	<p>Unable to get database handle from INCA.</p> <p>There was a problem detected while retrieving a handle to the current INCA database via COM. Please check if there is a valid database opened within INCA. If this is the case, please restart INCA and ASAP3.EXE.</p> <p>This error can only occur during startup of ASAP3.EXE and is displayed in a message box, it is never returned to the AuSy.</p>
60205	<p>Error could not be specified precisely (<hexadecimal error code>)</p> <p>An error (exception) occurred but there was no additional information about the error available. Only the error code (HRESULT in case of COM) is returned and given in the brackets as a hexadecimal number. Please restart INCA and ASAP3.EXE.</p>
60206	<p>Unable to open current opened Experiment</p> <p>While trying to get a handle of the current opened experiment in INCA, an error was returned. Please make sure that INCA has an experiment window open before starting ASAP3.EXE. When starting ASAP3.EXE regularly via the INCA menu "ASAM-3MC", this error should never occur.</p> <p>This error can only occur during startup of ASAP3.EXE and is displayed in a message box, it is never returned to the AuSy.</p>
60207	<p>No device with given description and binary name found in current workspace</p> <p>The command SELECT DESCRIPTION AND BINARY FILE was called with parameters that did not describe an existing device within INCA. Please specify a description file that is currently loaded within INCA. Use the database name or the file name of the description file (A2L file), according to the setting of the option "Use database names in 'SELECT / DEFINE DESCRIPTION FILE AND BINARY FILE'" of the ASAP3.EXE tool.</p>
60208	<p>Cannot set or create work base to/from file '<filename>' or cannot download</p> <p>There was an error while the file with the given name was read into INCA and set to a (new) work base during execution of the following commands (probably including the download to the target):</p> <p>SELECT DESCRIPTION AND BINARY FILE COPY BINARY FILE</p> <p>The Monitor window of INCA might show more information about this error.</p>

Error code (decimal)	Description
60210	<p>Cannot copy binary to file <filename></p> <p>During the execution of the COPY BINARY FILE command, an error occurred. The monitor window of INCA might show more information about this error. For example, the target file might already exist and be write-protected or the target path is on a write-protected media or the free space on the target media is not sufficient for the copy operation.</p> <p>COPY BINARY FILE</p>
60211	<p>Only the following combinations are supported: target 2 with source 3 or 4 target 3 with source 4 target 4 with source 3.</p> <p>The command COPY BINARY FILE was called with invalid parameters for source and/or target. Only the listed combinations are supported by this version.</p> <p>COPY BINARY FILE</p>
60212	<p>No device with given name found</p> <p>The device name given in the form variable\device is not available. In INCA it is possible to wire a variable in 2 ways.</p> <p>First as a combination of LUN and variable name. In this case the LUN represents the device and the variable must be a valid variable within the device represented by that LUN.</p> <p>Alternatively it is possible to use the combination of a variable\device instead of the variable. In this case the device supersedes the device addressed by the LUN. If a device with that name doesn't exist the error above is reported.</p> <p>PARAMETER FOR VALUE ACQUISITION DEFINE RECORDER PARAMETERS</p>
60213	<p>Only the modes 0 and 2 are supported</p> <p>The command DEFINE DESCRIPTION AND BINARY FILE was sent with the parameter <i>Mode</i> set to a value of 1 or 3. These values are not supported, only values 0 and 2 are.</p> <p>DEFINE DESCRIPTION AND BINARY FILE</p>
60214	<p>Unable to switch calibration access on</p> <p>This error is returned in case INCA is not able to switch the calibration access on. This may be due to errors in the hardware. Please see the Monitor window for further error description.</p> <p>SELECT DESCRIPTION FILE AND BINARY FILE DEFINE DESCRIPTION AND BINARY FILE INIT SWITCHING OFFLINE/ONLINE</p>

Error code (decimal)	Description
60215	<p>Unable to start measurement</p> <p>Some commands need to switch off INCA measurement before they can perform their main work. For example, to read and download a new binary file requires INCA to stop the measurement. After the command has performed its main work, measurement will be switched back on automatically. In case this switch fails, this error will be returned. A possible reason can be a hardware problem. Please check the monitor window for further error description.</p> <p>SELECT DESCRIPTION FILE AND BINARY FILE DEFINE DESCRIPTION FILE AND BINARY FILE SWITCHING OFFLINE/ONLINE COPY BINARY FILE RESET DEVICE</p>
60216	<p>Unable to stop measurement</p> <p>Some commands need to switch off INCA measurement before they can perform their main work. For example, to read and download a new binary file requires INCA to stop the measurement. In case this switch fails, this error will be returned. A possible reason can be a hardware problem. Please check the monitor window for further error description.</p> <p>SELECT DESCRIPTION FILE AND BINARY FILE DEFINE DESCRIPTION FILE AND BINARY FILE SWITCHING OFFLINE/ONLINE COPY BINARY FILE RESET DEVICE</p>
60217	<p>Unable to switch calibration access off</p> <p>This error is returned in case INCA is not able to switch the calibration access off. This may be due to errors in the hardware. Please check the Monitor window for further error description.</p> <p>SELECT DESCRIPTION FILE AND BINARY FILE DEFINE DESCRIPTION FILE AND BINARY FILE INIT SWITCHING OFFLINE/ONLINE</p>
60218	<p>Cannot reset device</p> <p>INCA returns an error when trying to reset a device. Please see the Monitor window for further error description.</p> <p>RESET DEVICE</p>
60219	<p>Received command while processing already command! Please increase timeout.</p> <p>ASAP3.EXE received a new command while it was still processing the previous command. This occurs often when ASAP3.EXE is busy with a command that lasts very long and the AuSy received a timeout and therefore repeated the last command. To prevent this, either optimize the options of ASAP3.EXE for high performance (turn off all logging, turn off LED indicators) or increase the timeout for the problematic command on AuSy side.</p>

Error code (decimal)	Description
60220	<p>Internal error (GetOverlappedResult (Read)); error code: <error code></p> <p>An error was reported by the operating system while reading data for the next command. The error code is given as decimal number in place of the text <error code> of the above message. The reason for this error is unclear. If this error occurs repeatedly, you should try to recover by restarting the whole system.</p>
60221	<p>Could not switch to reference page of at least one device.</p> <p>While executing the EMERGENCY command, INCA was not able to switch to the reference page of at least one device. See the monitoring window for additional error description.</p>
60222	<p>Unable to open current opened Experiment View</p> <p>ASAP3.EXE was unable to get a handle for the currently opened Experiment View in INCA. Please make sure that INCA has an experiment window open before starting ASAP3.EXE. When starting ASAP3.EXE regularly via the INCA menu "ASAM-3MC", this error should never occur. This error can only occur during startup of ASAP3.EXE and is displayed in a message box, it is never returned to the AuSy.</p>
60223	<p>This command requires at least Protocol Version 2.1</p> <p>This error occurs if one of the extended commands for services is executed but the AuSy did not identify with a version number of 2.1 or higher. To use the extended commands for services, please make sure that you identify with a protocol version that covers these commands.</p> <p>EXTENDED QueryAvailableServices EXTENDED GetServiceInformation EXTENDED ExecuteService</p>
60224	<p>Unknown service</p> <p>The service that was requested by the commands EXTENDED GetServiceInformation or EXTENDED ExecuteService is not supported by this version of ASAP3.EXE. Please make sure you use the correct version of ASAP3.EXE and that you only use supported commands (as reported by EXTENDED QueryAvailableServices). Currently, only the service "Switch Emulation Page" is supported.</p> <p>EXTENDED GetServiceInformation EXTENDED ExecuteService</p>
60225	<p>LUN parameter required for this service</p> <p>The service "Switch Emulation Page" requires the following parameters: LUN: <valid LUN number>; PAGE: <valid page number></p> <p>The service returns an empty string.</p> <p>If the parameter with the name "LUN" is missing, above error will be returned.</p> <p>EXTENDED ExecuteService (Switch Emulation Page)</p>

Error code (decimal)	Description
60226	<p>PAGE parameter required for this service</p> <p>The service "Switch Emulation Page" requires the following parameters: LUN: <valid LUN number>; PAGE: <valid page number></p> <p>The service returns an empty string.</p> <p>If the parameter with the name "PAGE" is missing, above error will be returned.</p> <p>EXTENDED ExecuteService (Switch Emulation Page)</p>
60227	<p>Error switching to reference page.</p> <p>INCA returned an error while trying to switch to the reference page. See the monitor window for further error description.</p> <p>EXTENDED ExecuteService (Switch Emulation Page)</p>
60228	<p>Only page numbers 0 (working page) and 1 (reference page) are supported.</p> <p>The command EXTENDED ExecuteService (Switch Emulation Page) contains an invalid value for the parameter PAGE. Only 0 and 1 are allowed.</p> <p>EXTENDED ExecuteService (Switch Emulation Page)</p>
60231	<p>No device with given destination, description and binary name found.</p> <p>ASAP3 was not able to find a device with the given destination, description file and binary name in the INCA database while executing the command DEFINE DESCRIPTION FILE AND BINARY FILE. Please check that the correct names and the destination are given and that the option "Use database names in 'SELECT / DEFINE DESCRIPTION FILE AND BINARY FILE'" in the General options dialog is set correctly.</p> <p>DEFINE DESCRIPTION FILE AND BINARY FILE</p>

Error code (decimal)	Description
60233	<p>Unable to switch calibration access on because there is a running MDA. You should go online before starting MDA.</p> <p>This error occurs either in case you execute a SWITCHING OFFLINE/ONLINE command with parameter <i>Mode</i> equal to 1 (ON-LINE) while there is already a recorder (Measurement Data Acquisition) running, in order to prepare online calibration,</p> <p>or in case you execute a SELECT DESCRIPTION FILE AND BINARY FILE command while there is already a recorder running and the option "Data &Download at 'SELECT DESCRIPTION FILE AND BINARY FILE'" was checked,</p> <p>or in case you execute a DEFINE DESCRIPTION FILE AND BINARY FILE command while there is already a recorder running and the <i>Mode</i> parameter is set to 2.</p> <p>The SELECT/DEFINE DESCRIPTION FILE AND BINARY FILE commands try to switch the calibration access on, if this was not yet done with a preceding SWITCHING OFFLINE/ONLINE command. In case there was already a recorder started, INCA is not able to switch the calibration access on.</p> <p>To circumvent this problem, stop the recorder before executing the SELECT/DEFINE ESCRIPTION FILE AND BINARY FILE commands.</p> <p>SELECT DESCRIPTION FILE AND BINARY FILE DEFINE DESCRIPTION FILE AND BINARY FILE SWITCHING OFFLINE/ONLINE</p>
60234	<p>Cannot upload workbase from device!</p> <p>This error occurs if the command COPY BINARY FILE is executed with the parameter <i>Target</i> set to 3 (virtual emulator board; PC memory) and the parameter <i>Source</i> set to 4 (physical emulator board; e.g. ETK) and INCA is not able to upload the workbase from the physical emulator board into the PC. See the Monitor window for further error descriptions.</p> <p>COPY BINARY FILE</p>
60236	<p>Cannot download workbase to device!</p> <p>This error occurs if the command COPY BINARY FILE is executed with the parameter <i>Target</i> set to 4 (physical emulator board; e.g. ETK) and the parameter <i>Source</i> set to 3 (virtual emulator board; PC memory) and INCA is not able to download the workbase from the PC into the physical emulator board. See the Monitor window for further error descriptions.</p> <p>COPY BINARY FILE</p>

Error code (decimal)	Description
60237	<p>The command '<command name>' cannot be executed while the system is online. Please go offline first.</p> <p>This error can appear when either the command SELECT DESCRIPTION FILE AND BINARY FILE (3), the command DEFINE DESCRIPTION FILE AND BINARY FILE (30) or the command COPY BINARY FILE (4) is executed. In the error message, the text <command name> is replaced by the according command name.</p> <p>To execute above commands, INCA needs to perform certain actions that are not possible while ASAP3 is in the online state. Therefore, the AuSy has to explicitly switch to off-line mode before executing one of these commands.</p> <p>SELECT DESCRIPTION FILE AND BINARY FILE DEFINE DESCRIPTION FILE AND BINARY FILE COPY BINARY FILE</p>
60238	<p>Create Dispatch Error: Cannot connect to the INCA process. This is probably due to a bad installation of the JAVA runtime. Please execute msjvax86.exe in the INCA cebra directory.</p> <p>Original error text: <original error text from the COM subsystem></p> <p>When starting, ASAP3.EXE tries to connect to running instance or to create a new instance of INCA. If this is not possible, above error message is shown. The original error text that follows above error message is emitted by the COM subsystem and can give additional hints why INCA cannot be connected to or started.</p> <p>This error occurs only during startup of ASAP3.EXE.</p> <p>Please check that the JAVA runtime is installed correctly. If not, execute msjvax86.exe from the subdirectory "cebra" in your INCA program installation directory.</p> <p><u>Note:</u> Starting with INCA 6.0, the Cebra protocol is implemented using .NET instead of Java. If this error occurs in INCA 6.0 or higher, the installation of the .NET runtime has to be checked.</p>
60239	<p>Cannot set workbase to the following database entry:</p> <p>If the attempt to assign a new working data set to a device within INCA fails, the above error is returned. The error can only occur when the option "Use database names in 'SELECT / DEFINE DESCRIPTION FILE AND BINARY FILE'" in the General options dialog is checked. See the monitor window for more error information.</p> <p>SELECT DESCRIPTION FILE AND BINARY FILE DEFINE DESCRIPTION FILE AND BINARY FILE</p>
60240	<p>No MeasureCal device with given name found</p> <p>The device given in PARAMETER FOR VALUE ACQUISITION or DEFINE RECORDER PARAMETERS can not be found. This is an internal error or may be caused due to a configuration change during an ASAP3 session.</p> <p>PARAMETER FOR VALUE ACQUISITION GET USER DEFINED VALUE LIST DEFINE RECORDER PARAMETERS</p>

Error code (decimal)	Description
60241	<p>Cannot download working page "<data set name>" to device. Please see INCA monitor log for further information.</p> <p>If the option "Data Download at 'SELECT DESCRIPTION FILE AND BINARY FILE'" in the General options dialog is checked, ASAP3.EXE tries to download the working page to the device after the working data set has been selected within the commands SELECT DESCRIPTION FILE AND BINARY FILE and DEFINE DESCRIPTION FILE AND BINARY FILE. If this fails, above error is returned.</p> <p>SELECT DESCRIPTION FILE AND BINARY FILE DEFINE DESCRIPTION FILE AND BINARY FILE</p>
60242	<p>Cannot create a copy of the data set with the new name '<new data set name>' in project '<project name>'.</p> <p>In case the SELECT DESCRIPTION FILE AND BINARY FILE command is executed while the options "Data Download at 'SELECT DESCRIPTION FILE AND BINARY FILE'" and "Create New DS at Download within MCS" are checked, or the DEFINE DESCRIPTION FILE AND BINARY FILE command is executed with parameter <i>Mode</i> set to 2 while the option "Create New DS at Download within MCS" is checked, ASAP3.EXE tries to create a copy of the selected data set. If INCA is not able to create a copy, the error message is shown.</p> <p>SELECT DESCRIPTION FILE AND BINARY FILE DEFINE DESCRIPTION FILE AND BINARY FILE</p>
60244	<p>No RAMCal device with given name found</p> <p>This error can occur if during the calibration access (table or parameter) to a label that represents a measurement the corresponding RAMCal device for the device of that label could not be found in the current experiment.</p>
60245	<p>MODULE parameter required for this service.</p> <p>This error can occur during the "EXTENDED ExecuteService" command with one of the services "Set Option", "Get Option" or "Get State" when the parameter MODULE is missing in the service input parameter string.</p>
60246	<p>%s parameter required for this service.</p> <p>This error can occur during the "EXTENDED ExecuteService" command execution with one of the services "Get Option", "Get State", "Get Option Information" or "Get State Information" when the parameter OPTIONNAME or STATENAME is missing.</p>
60247	<p>OPTIONVALUE parameter required for this service.</p> <p>This error can occur during the "EXTENDED ExecuteService" command execution with the service "Set Option" when the parameter OPTIONVALUE is missing.</p>

Error code (decimal)	Description
60248	<p>The INCA method Get-/SetOption or GetStatus or GetOption-/GetStatusInfo returns the following error: <Followed by a service specific INCA error text></p> <p>This error can occur if any of the following "EXTENDED ExecuteService" command services fails within core INCA: "Set Option", "Get Option", "Get State", "Get Option Information" and "Get State Information". The INCA error text is appended to the shown error text.</p>
60282	<p>There is already a LUN to the first device in the INCA workspace assigned!</p> <p>For protocol version 2.01, ASAP3 allows to access the first device in the INCA workspace by using the LUN 0. This is possible without the need of the AuSy to explicitly call the command SELECT DESCRIPTION FILE AND BINARY FILE or DEFINE DESCRIPTION FILE AND BINARY FILE and is intended to work as a shortcut. Internally, with the first use of the LUN 0, almost the same process is executed as with SELECT DESCRIPTION FILE AND BINARY FILE, which would create a LUN 0 as the first device in the INCA workspace. In case this process detects that already another command requested a LUN for the same first device in the INCA workspace, this error is returned, because it is not allowed to have two LUNs assigned to the same device.</p> <p>SELECT LOOK-UP TABLE GET PARAMETER SET PARAMETER COPY BINARY FILE CHANGE BINARY FILE NAME RESET DEVICE EXTENDED ExecuteService (Switch Emulation Page) PARAMETER FOR VALUE ACQUISITION DEFINE RECORDER PARAMETERS</p>
60283	<p>Loading data into the INCA database is not allowed during online state to avoid inconsistencies between the ECU and MCD system.</p> <p>The command COPY BINARY FILE was called with the parameter <i>Target</i> set to 3 (virtual emulator board; INCA Database) and the parameter <i>Source</i> set to 2 (File).</p> <p>Advice: Explicitly switch off-line with command SWITCHING OFF-LINE/ON-LINE before issuing the COPY BINARY FILE (<i>Source=2, Target=3</i>).</p> <p>COPY BINARY FILE</p>
60284	<p>Internal error: Cannot retrieve the project database path of the device '<device name>' (INCACOM GetProjectDataBasePath)</p> <p>When the commands SELECT DESCRIPTION FILE AND BINARY FILE and DEFINE DESCRIPTION FILE AND BINARY FILE are executed, ASAP3.EXE has to look for a device within INCA that has the given description file loaded. In case INCA issues an error when it is asked for the description file name of a given device, above error is shown; <device name> is hereby replaced by the current device under investigation.</p> <p>See the monitor window for more information about the error.</p> <p>SELECT DESCRIPTION FILE AND BINARY FILE DEFINE DESCRIPTION FILE AND BINARY FILE</p>

Error code (decimal)	Description
60285	<p>Internal Error: The project database path of the device '<device name>' is empty! (INCACOM GetProjectDataBasePath)</p> <p>When the commands SELECT DESCRIPTION FILE AND BINARY FILE and DEFINE DESCRIPTION FILE AND BINARY FILE are executed, ASAP3.EXE has to look for a device within INCA that has the given description file loaded. In case INCA returns an empty name when it is asked for the description file name of a given device, above error is shown; <device name> is hereby replaced by the current device under investigation.</p> <p>See the monitor window for more information about the error.</p> <p>SELECT DESCRIPTION FILE AND BINARY FILE DEFINE DESCRIPTION FILE AND BINARY FILE</p>
60286	<p>Cannot find data set '<data set name>' in project '<project database path>'. Please verify project name and data set name. Be sure to prefix the data set name with the folder name within project!</p> <p>If the option "Use database names in 'SELECT / DEFINE DESCRIPTION FILE AND BINARY FILE'" in the General options dialog is checked and either of the commands SELECT DESCRIPTION FILE AND BINARY FILE or DEFINE DESCRIPTION FILE AND BINARY FILE is called with a dataset name that does not exist within INCA in the given project name, the above error is returned. Please check that the project specified with the given project data base path contains a data set that has the same name as indicated as the data set name.</p> <p>SELECT DESCRIPTION FILE AND BINARY FILE DEFINE DESCRIPTION FILE AND BINARY FILE</p>
60287	<p>Passover time from receive thread exceeded 1 second: <number of milliseconds> ms total passover time. Possible reason: system load too high</p> <p>ASAP3.EXE uses a separate thread to read commands from the serial line or from TCP/IP. If a new command is available, the main thread is notified about this fact. The main thread then tries to read the command as soon as possible. If the time between notification and current reading of the command is longer than one second, this warning is logged in the logging window to inform the user about a possibly too high system load. Normally, passing a received telegram to the main thread should be a matter of a few (e.g. 10) milliseconds.</p> <p>This error is never returned to the AuSy.</p>
60288	<p>No memory pages supported!</p> <p>This error can occur with the EXTENDED Service "Switch Emulation Page". It means that the used Device (LUN) does not support memory pages and therefore the command cannot be applied.</p>
60289	<p>Only one memory page supported!</p> <p>This error can occur with the EXTENDED Service "Switch Emulation Page". It means that the used Device (LUN) does support only one memory page and therefore the command cannot be applied.</p>
60305	<p>Invalid meta data identifier.</p> <p>This error can occur with the EXTENDED Service "Get Tool Setup Information" and means that an unknown/unsupported meta data identifier was used in the request string.</p>

Error code (decimal)	Description
60306	<p>This meta data identifier is only supported for LUNs which refer w orkbase devices (devices with associated data set) This error can occur with EXTENDED Service "Get Tool Setup Information" and means that a LUN was used that does not support the requested meta data identifier, e.g. an AD-Converter cannot be asked about the name of his working page, because there is no working page for this device type.</p>
60307	<p>INFO parameter required! This error can occur with EXTENDED Service "Get Tool Setup Information" and means that the mandatory "INFO" parameter is missing in the request string. Check the syntax of the string.</p>
60321	<p>The "AlwaysUseFuliDeviceIfAvailable" option cannot be changed because this functionality is currently in use. This error is returned if the user tries to execute the EXTENDED ExecuteService command with service SetOption for MODULE: ASAP3 and OPTIONNAME: AlwaysUseFuliDeviceIfAvailable set to OPTIONVALUE: true but there are already devices (LUNs) created and hence system consistency can only be guaranteed by keeping this option as it was for the first created device (LUN).</p>
60505	<p>The command can't be executed because the index which is used to have access to the data is out of the possible limits! SET LOOK-UP TABLE GET LOOK-UP TABLE VALUE INCREASE LOOK-UP TABLE</p>
60512	<p>Because of write protection the map values can't be changed! Possible reason could be that the wrong page is active (reference page) or that the map is write-protected. PUT LOOK-UP TABLE INCREASE LOOK-UP TABLE SET LOOK-UP TABLE</p>
60513	<p>Because of write protection the x-axis values can't be changed! Possible reason could be that the wrong page is active (reference page) or that the map is write-protected. PUT LOOK-UP TABLE</p>
60514	<p>Because of write protection the y-axis values can't be changed! Possible reason could be that the wrong page is active (reference page) or that the map is write-protected. PUT LOOK-UP TABLE</p>
60515	<p>Because of write protection the parameter value can't be changed! Possible reason could be that the wrong page is active (reference page) or that the map is write-protected. SET PARAMETER</p>
60517	<p>The access to the working point data is not possible because the feature is currently disabled in the ASAP3 options. The option "Enable Working Point functionality for 1D and 2D characteristics (curves and maps)" in the "Online" option tab is not checked.</p>

Error code (decimal)	Description
60800	<p>The value [...] is already wired as Recorder value!</p> <p>It is not possible to wire a recorder value twice. As the DEFINE RECORDER PARAMERTERS command is cumulative, please check if you have wired that value in a prior call of DEFINE RECORDER PARAMETERS.</p> <p>DEFINE RECORDER PARAMETERS</p>
60801	<p>The value [...] is already wired as Online value!</p> <p>It is not possible to wire an online value twice. As the PARAMETER FOR VALUE ACQUISTION command is cumulative, please check if you have wired that value in a prior call of PARAMETER FOR VALUE ACQUISITION.</p> <p>PARAMETER FOR VALUE ACQUISITION</p>
60808	<p>The value [...] is contained twice in the list r the new values!</p> <p>It is not possible to wire the same value twice. Please check the value list of the current command, it must contain the same value twice.</p> <p>PARAMETER FOR VALUE ACQUISITION DEFINE RECORDER PARAMETERS</p>
60809	<p>Invalid start trigger condition!</p> <p>Please check your trigger condition for:</p> <ul style="list-style-type: none"> - Typing errors - Missing blanks between variables and operators - Wrong device names for variables - Missing quotation marks for variables or variable/device names that contain blanks <p>DEFINE TRIGGER CONDITION</p>
60810	<p>Invalid stop trigger condition!</p> <p>Please check your trigger condition for:</p> <ul style="list-style-type: none"> - Typing errors - Missing blanks between variables and operators - Wrong device names for variables - Missing quotation marks for variables or variable/device names that contain blanks <p>DEFINE TRIGGER CONDITION</p>
60811	<p>Command [...] is not possible while recorder is running. Stop recorder with the command ACTIVATE RECORDER and Mode=0 first!</p> <p>The recorder must be stopped for the current command.</p> <p>PARAMETER FOR VALUE ACQUISTION GET USER DEFINED VALUE LIST DEFINE RECORDER PARAMETERS DEFINE TRIGGER CONDITION GET RECORDER RESULTS HEADER GET RECORDER RESULTS SAVE RECORDER FILE LOAD RECORDER FILE</p>

Error code (decimal)	Description
60812	<p>No recorder data available. Load a recorder file or set up a new recording first! If a start trigger is configured, check if it was in conditioned state.</p> <p>A possible reason could also be that the last LOAD RECORDER FILE operation failed for some reason (e.g. access restrictions, corrupted file etc).</p> <p>GET RECORDER RESULTS HEADER GET RECORDER RESULTS SAVE RECORDER FILE</p>
60816	<p>No device found for LUN [...]</p> <p>Please check your script for prior errors. A possible reason could be a missing or failed SELECT DESCRIPTION FILE AND BINARY FILE or DEFINE DESCRIPTION FILE AND BINARY FILE.</p> <p>PARAMETER FOR VALUE ACQUISITION GET USER DEFINED VALUE LIST DEFINE RECORDER PARAMETERS</p> <p><u>Note:</u> Only devices that support calibration pages can be used with the SELECT DESCRIPTION FILE AND BINARY FILE command or the standard syntax of the DEFINE DESCRIPTION FILE AND BINARY FILE command. See the <u>_AUXIN_</u> variant of the DEFINE DESCRIPTION FILE AND BINARY FILE for further information.</p>
60819	<p>Start/stop trigger not possible in combination with Nr. of Samples!</p> <p>If triggers are defined Nr. of Samples must be set to 0!</p> <p>INCA does only support start/stop trigger <u>or</u> sample limitation over ASAP3.</p> <p>DEFINE TRIGGER CONDITION</p>
60820	<p>The file [...] already exists and can not be overwritten because it is read-only!</p> <p>Remove the read-only flag from this file to be able to overwrite it. Check also if the target device (e.g. a removable media) is write-protected.</p> <p>This error could also be caused by right limitations on a network drive. In this case you have to contact you network administrator.</p> <p>SAVE RECORDER FILE</p>
60823	<p>No acquisition rates available for the device with LUN [...]</p> <p>Perhaps the ASAP2 file does contain incorrect raster definitions for the device represented by the LUN.</p> <p>PARAMETER FOR VALUE ACQUISITION DEFINE RECORDER PARAMETERS</p>

Error code (decimal)	Description
60825	<p>1. An error occurred when adding new value(s)! The following value(s) could not be found: [60815] Please check the spelling or case of the values. PARAMETER FOR VALUE ACQUISITION DEFINE RECORDER PARAMETERS Do also check the option "Labels are case sensitive" in the General page of the Options dialog. In some cases the client uses variable names in uppercase which will fail if this option is set.</p> <p>2. An error occurred when adding new value(s)! Could not add the following value(s) because all raster tables are full: [60826] No further wiring possible. Try to remove variables before adding new ones. PARAMETER FOR VALUE ACQUISITION DEFINE RECORDER PARAMETERS</p> <p>3. An error occurred when adding new value(s)! Could not get a Raster for the following variables (Check your ASAP2 file): [60828] The ASAP2 file might contain incorrect raster definitions. PARAMETER FOR VALUE ACQUISITION DEFINE RECORDER PARAMETERS</p>
60832	<p>Command not possible because a 'LOAD RECORDER FILE' command is still running in the background! ASAP3 performs a LOAD RECORDER FILE in the background, to allow for a fast response to the LOAD RECORDER FILE command. During the background execution of this command, no other command that affects the recorder configuration, is allowed to be executed. ACTIVATE RECORDER GET RECORDER STATUS GET RECORDER RESULTS HEADER GET RECORDERRESULTS SAVE RECORDER FILE LOAD RECORDER FILE</p>

Error code (decimal)	Description
60833	<p>Command not possible because a 'SAVE RECORDER FILE' command is still running in the background!</p> <p>ASAP3 performs a LOAD RECORDER FILE in the background to allow for a fast response to the LOAD RECORDER FILE command. During the background execution of this command, no other command that affects the recorder configuration is allowed to be executed.</p> <p>ACTIVATE RECORDER GET RECORDER STATUS GET RECORDER RESULTS HEADER GET RECORDERRESULTS SAVE RECORDER FILE LOAD RECORDER FILE</p>
60847	<p>Mixed use of 'STANDARD' and 'EXTENDED' PARAMETER FOR VALUE ACQUISITION and GET ONLINE VALUE commands is not allowed. Please clear the acquisition list before switching command types.</p> <p>PARAMETER FOR VALUE ACQUISITION and EXTENDED PARAMETER FOR VALUE ACQUISITION can only be used mutually exclusive. To switch the command types, the acquisition list has to be cleared before, e.g. by using one of both commands with the parameter "Number of Values" set to 0.</p>
60848	<p>An RCI2-error occurred when adding new value(s): %1. Please close ASAP3, reopen the experiment and restart ASAP3 to ensure that INCA again is in a consistent state.</p> <p>This error can occur during PARAMETER FOR VALUE ACQUISITION in case an user interaction in the GUI of INCA took place that caused the measurement setup to change. (This is an unsupported use case and can lead to an instable system. Therefore the GUI should not be used during ASAP3 use.)</p>

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